Drainage Narrative
Keating Residence
Cliff Road, Tuxedo Park, NY
Rev. 7/17/14 (to match plan date, no change in design)

Introduction

The intent of this report is to analyze existing versus proposed storm water run-off characteristics for proposed development of the above site, on the west side of Cliff Road, in the Village of Tuxedo Park. We utilized "Hydraflow Hydrographs" software and the modified rational method for determining times of concentration, peak flows and detention system routings.

Existing Conditions

The property in question has a total area of 2.03 acres. It currently is vacant. The property contains large rock outcrops and is steeply sloped. The property's run-off is divided along a ridge, with 1.55 acres flowing west and 0.48 acres flowing east. The existing drainage area map is attached. The lot once contained a partially constructed dwelling that was demolished due to structural issues. Part of that development included at least four (4) seepage pits for roof leader run-off. The current owner has investigated the condition and capacity of these pits and intends to utilize them for proposed storm water detention on site.

Proposed Conditions

The applicant proposes to construct a new single family dwelling, driveway, pool and patio. The intent of this report is to match the existing peak flows, both easterly and westerly, as closely as possible post-development. Proposed drainage area maps are attached.

The flow to the west will include the proposed driveway and the northerly side yard of the proposed dwelling. The driveway run-off will be collected by a trench drain and piped to the existing seepage pit near the northerly property line. This seepage pit will overflow to a level spreader that will distribute any overflow and allow it to continue flowing in a westerly direction. We are decreasing the overall drainage area to the west so that proposed peak flow rates will be reduced without the need for any storm water detention. As above, the existing seepage pit will be utilized to further attenuate flows, but is not necessary due to the overall reduction in drainage area.

The flow to east will be reduced by utilizing the existing three (3) seepage pits in front of the proposed dwelling. All proposed roof leaders and patio drainage will be piped to the existing seepage pits. The system to the west will be slightly reduced by decreasing the tributary area to the west. The modified rational method hydrographs showing the existing peak flow rate to the east versus proposed flow rates for varying storm durations are attached to this report. The maximum storage of 89 cf (666 gallons) required occurs during the 25-year storm, when Tc=Td=10 minutes. The existing seepage pits have significantly more volume available, and will provide more than adequate storage to decrease peak flows from the site.

The easterly system will be a closed system, with overflow tee connectors on the proposed roof leaders set above the lowest patio perimeter drain elevation of 700.00. In this manner, the system can overflow by backing up flow through the perimeter drain, spreading the flow over the entire length of the house and patio.

Conclusions

Proposed flow to the west will be decreased by a decrease in the overall drainage area. Flow from the driveway will be directed to the existing northerly seepage pit, and overflow via a level spreader which will further mitigate peak flows (even though storage to the west is not required).

Proposed flow to the east will be decreased by utilizing the storage in the three (3) existing seepage pits near the front of the property. Based on the modified rational method, our existing storage is almost ten (10) times what is required. This system will overflow via the proposed pool/patio perimeter drain, spreading the flow over a large area so as not create any concentrated flows.

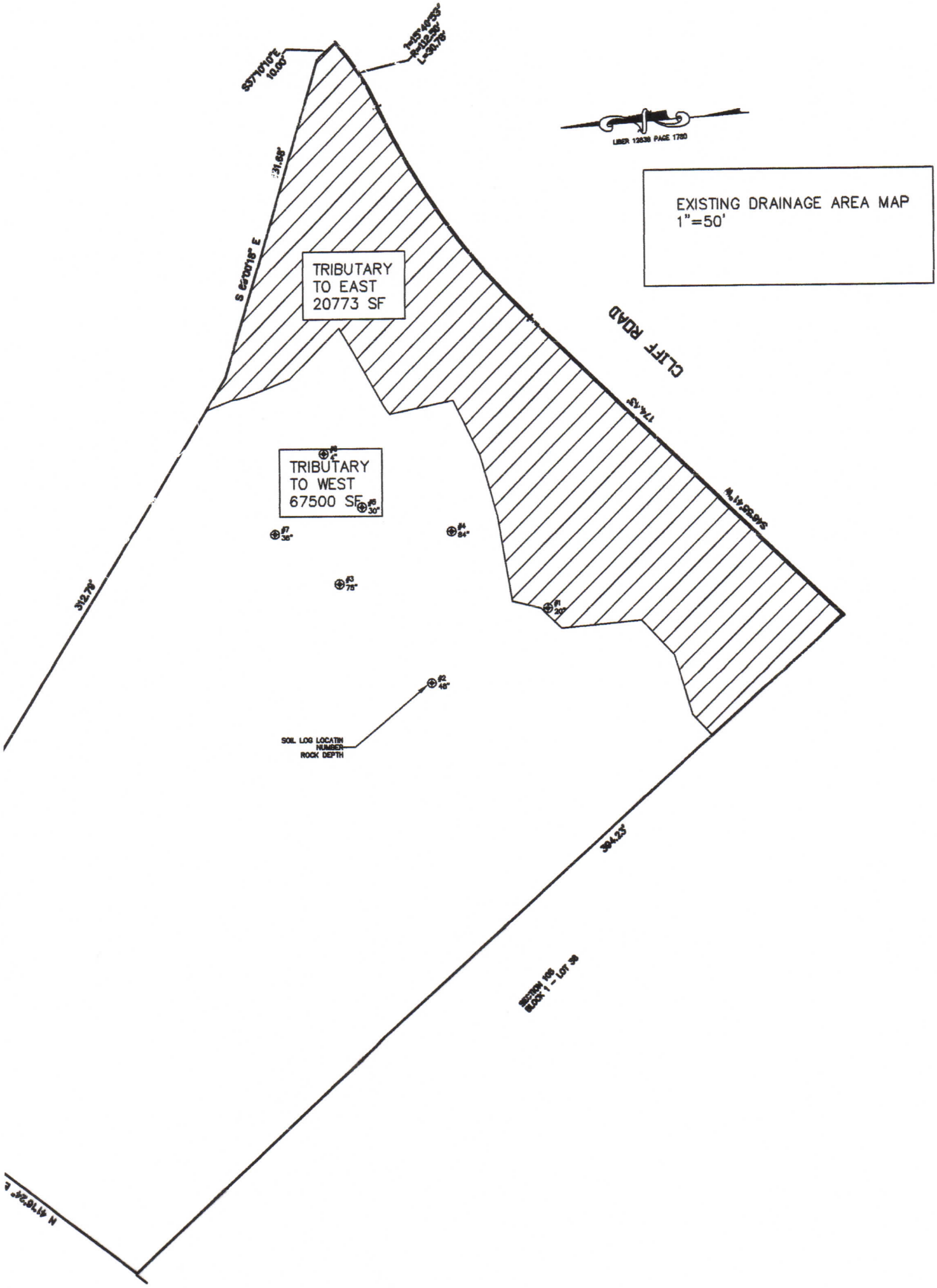
Thomas Skrable, P.E.
NYSPE # 075377

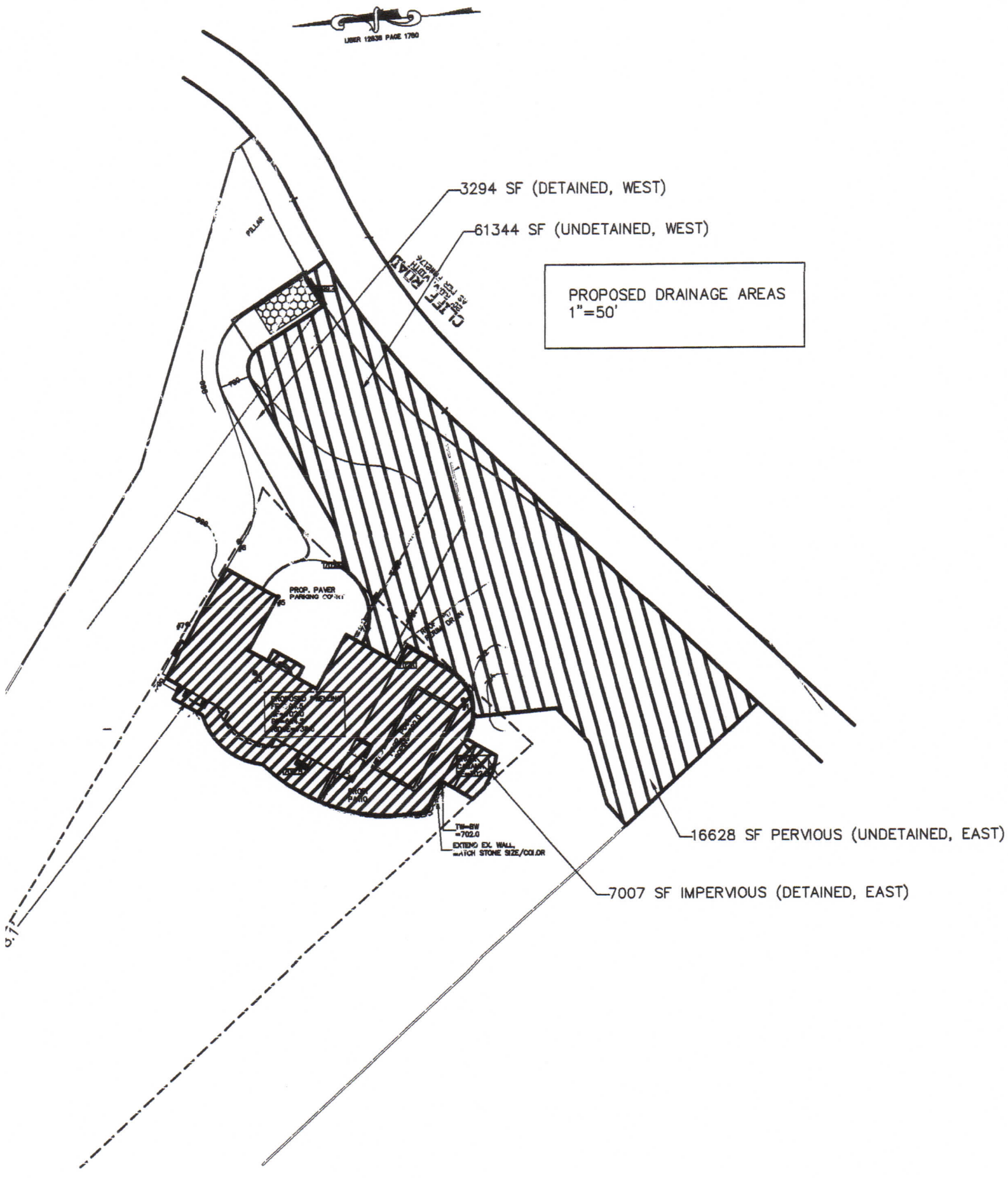
DRAINAGE SUMMARY
KEATING - CLIFF ROAD
SECTION 106 - BLOCK 1 - LOT 75.2
VILLAGE OF TUXEDO PARK - TOWN OF TUXEDO
DATE 1/13/14

	EX. EAST	PROP. UNDET. EAST	PROP. DET. EAST	MAX. STORAGE REQ'D
STORM	**CFS**	**CFS**	**CFS**	**CF**
2 YEAR	1.06	0.64	0.56	52
10 YEAR	1.56	0.94	0.83	78
25 YEAR	1.83	1.10	0.97	89
100 YEAR	2.31	1.39	1.23	N/A
	EX. WEST	**PROP. UNDET. WEST**	**PROP. DET. WEST**	**MAX. STORAGE REQ'D**
STORM	**CFS**	**CFS**	**CFS**	**CF**
2 YEAR	2.40	1.54	0.28	N/A
10 YEAR	3.55	2.28	0.41	N/A
25 YEAR	4.13	2.65	0.49	N/A
100 YEAR	5.32	3.42	0.62	N/A

NOTES:

1. MAX. STORAGE REQUIRED BASED ON MODIFIED RATIONAL METHOD HYDROGRAPHS ATTACHED TO THIS REPORT.
2. DUE TO DECREASE IN TRIBUTARY DRAINAGE AREA, ALL STORM RATES AND VOLUMES DECREASE TO THE WEST, STORAGE REQUIRED.


EXISTING DRAINAGE AREA MAP
1"=50'
TRIBUTARY
TO EAST
20773 SF
TRIBUTARY
TO WEST
67500 SF
CLIFF ROAD
LIBER 12838 PAGE 1780
S37°10'10"E
10.00'
S 67°00'18" E
312.76'
174.45'
S46°58'41"W
304.23'
SOIL LOG LOCATIN
NUMBER
ROCK DEPTH


LIBER 12938 PAGE 1780
3294 SF (DETAINED, WEST)
61344 SF (UNDETAINED, WEST)
PROPOSED DRAINAGE AREAS
1"=50'
PILLAR
PROP. PAVER
PARKING CO'NT
TW=BW
=702.0
EXTEND EX. WALL,
=MATCH STONE SIZE/COLOR
16628 SF PERVIOUS (UNDETAINED, EAST)
7007 SF IMPERVIOUS (DETAINED, EAST)

DRAINAGE AREA BREAKDOWN
KEATING - CLIFF ROAD
SECTION 106 - BLOCK 1 - LOT 75.2
VILLAGE OF TUXEDO PARK - TOWN OF TUXEDO
DATE 1/13/14

LOT AREA = 88273 SF 2.03 ACRES

EXISTING DRAINAGE AREAS:

1. AREA FLOWING TO THE EAST

	SF	ACRES	C VALUE
ROCK OUTCROP	5,000	0.11	0.99
PERVIOUS, WOODS	15,773	0.36	0.50
TOTAL AREA	20,773	0.48	0.62

2. AREA FLOWING TO THE WEST

	SF	ACRES	C VALUE
ROCK OUTCROP	1,000	0.02	0.99
PERVIOUS, WOODS	66,500	1.53	0.50
TOTAL AREA	67,500	1.55	0.51

PROPOSED DRAINAGE AREAS:

1. AREA UNDETAINED TO WEST

	SF	ACRES	C VALUE
ROCK OUTCROP	1,000	0.02	0.99
PERVIOUS. LAWN	60,344	1.39	0.35
TOTAL AREA	61,344	1.41	0.36

2. AREA DETAINED TO WEST

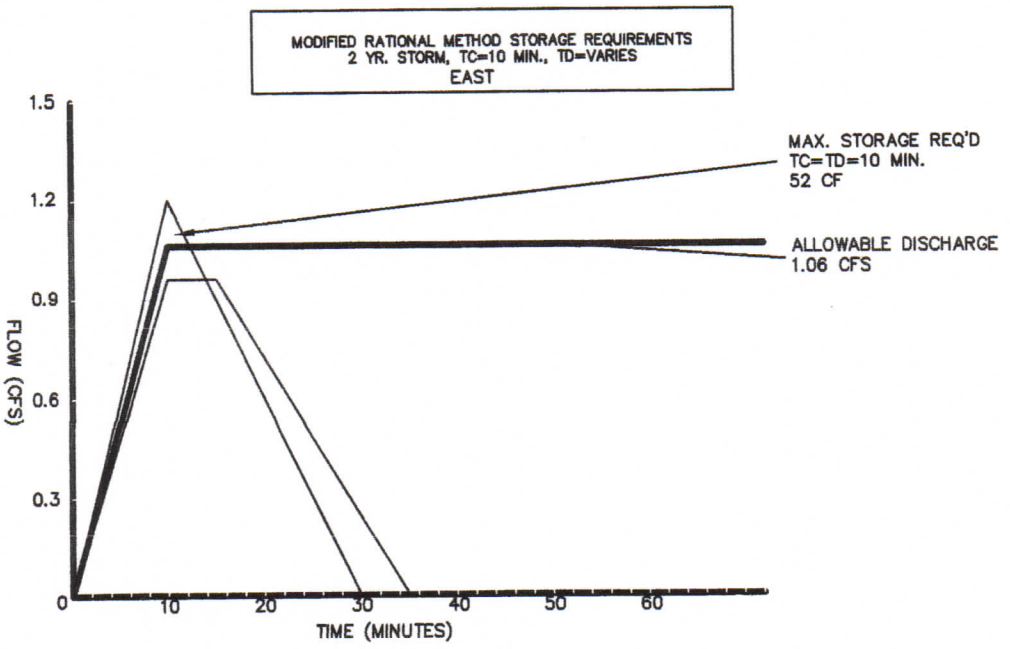
	SF	ACRES	C VALUE
IMPERVIOUS	3,294	0.08	0.99
PERVIOUS, LAWN	-	-	-
TOTAL AREA	3,294	0.08	0.99

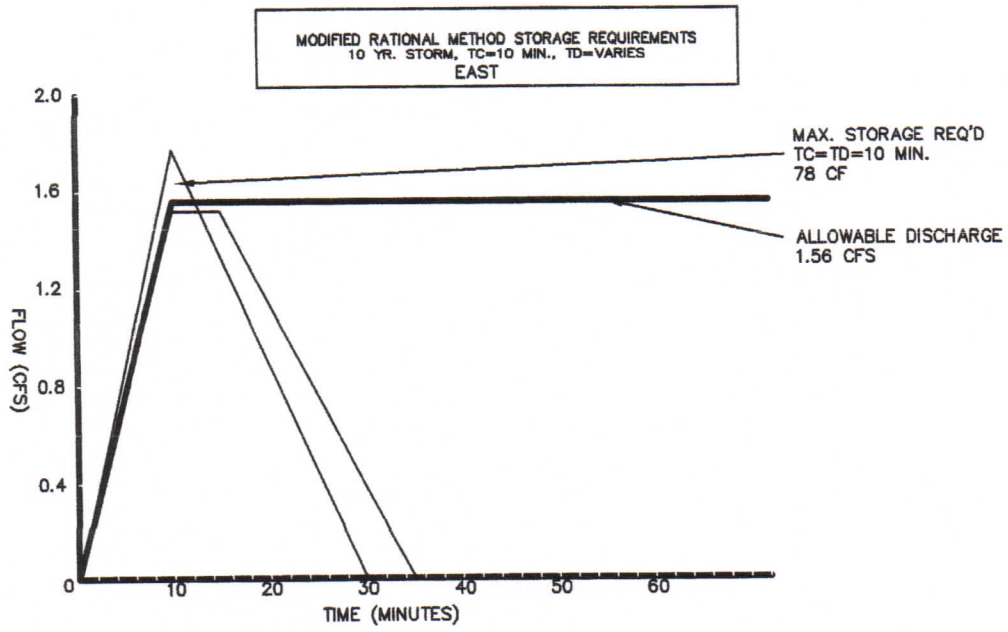
3. AREA UNDETAINED TO EAST

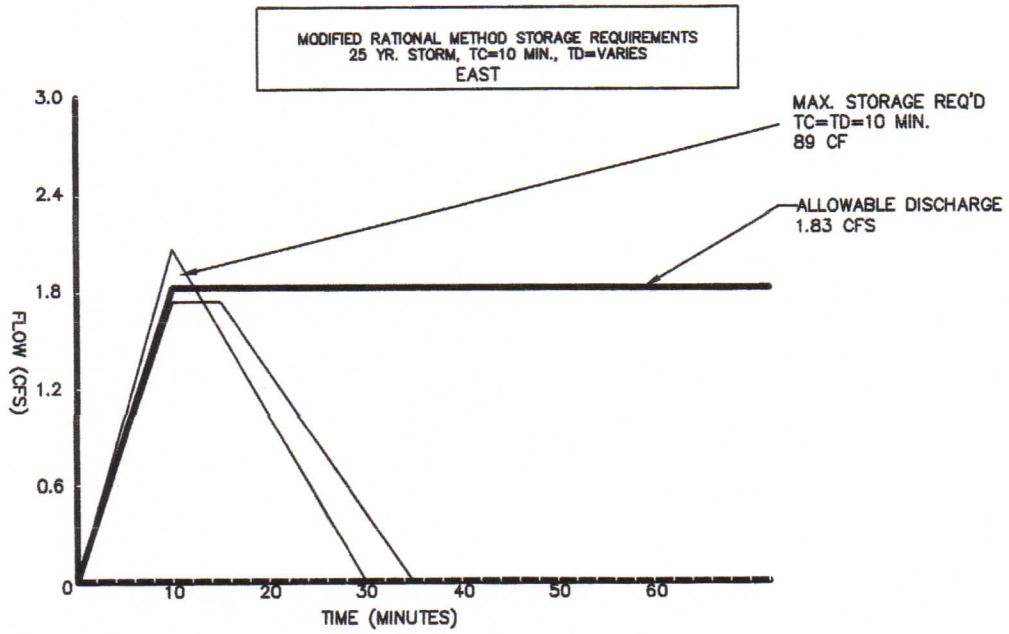
	SF	ACRES	C VALUE
ROCK OUTCROP	3,000	0.07	0.99
PERVIOUS, LAWN	13,628	0.31	0.35
TOTAL AREA	16,628	0.38	0.47

4. AREA DETAINED TO EAST

	SF	ACRES	C VALUE
ROCK OUTCROP	7,007	0.16	0.99
PERVIOUS	-	-	-
TOTAL AREA	7,007	0.16	0.99


MODIFIED RATIONAL METHOD STORAGE REQUIREMENTS
2 YR. STORM, TC=10 MIN., TD=VARIES
EAST
1.5
1.2
0.9
0.6
0.3
0
FLOW (CFS)
10
20
30
40
50
60
TIME (MINUTES)
MAX. STORAGE REQ'D
TC=TD=10 MIN.
52 CF
ALLOWABLE DISCHARGE
1.06 CFS


MODIFIED RATIONAL METHOD STORAGE REQUIREMENTS
10 YR. STORM, TC=10 MIN., TD=VARIES
EAST
2.0
1.6
1.2
0.8
0.4
0
FLOW (CFS)
10
20
30
40
50
60
TIME (MINUTES)
MAX. STORAGE REQ'D
TC=TD=10 MIN.
78 CF
ALLOWABLE DISCHARGE
1.56 CFS


MODIFIED RATIONAL METHOD STORAGE REQUIREMENTS
25 YR. STORM, TC=10 MIN., TD=VARIES
EAST
MAX. STORAGE REQ'D
TC=TD=10 MIN.
89 CF
ALLOWABLE DISCHARGE
1.83 CFS
FLOW (CFS)
3.0
2.4
1.8
1.2
0.6
0
10
20
30
40
50
60
TIME (MINUTES)

PROPOSED SEEPAGE PIT STORAGE CALCULATIONS
SINGLE NORTHERLY PIT
KEATING, CLIFF ROAD
VILLAGE OF TUXEDO PARK

STORAGE REQUIRED	
STORAGE VOLUME REQUIRED	0 GALLONS
SEEPAGE PIT STORAGE VOLUME	
NUMBER OF PITS:	1 PITS
INSIDE DIAMETER	6 FT
INSIDE HEIGHT	2.5 FT**
TOTAL HEIGHT	3.42 FT
VOLUME INSIDE PIT	70.69 CF
	528.73 GALLONS
STONE STORAGE VOLUME	
LENGTH	6.5 FT
WIDTH	6.5 FT
DEPTH BELOW PITS	0 FT
OUTSIDE DIAM. OF PIT	6.5 FT
STONE BELOW PITS	0 CF
	0 GALLONS
STONE OUTSIDE PITS (BELOW INVERT)	9.07 CF
	67.82 GALLONS
TOTAL STONE	67.82 GALLONS
PITS AND STONE CAPACITY:	
PITS	528.73
STONE	67.82
STORAGE VOLUME PROVIDED	**596.55 GALLONS**

ASSUMED STONE VOIDS = 40%

** - HEIGHT REDUCED DUE TO 4" STANDING WATER IN PIT

PROPOSED SEEPAGE PIT STORAGE CALCULATIONS
THREE (3) SOUTHERLY PITS
KEATING, CLIFF ROAD
VILLAGE OF TUXEDO PARK

STORAGE REQUIRED	
STORAGE VOLUME REQUIRED	666 GALLONS (89 CF)
SEEPAGE PIT STORAGE VOLUME	
NUMBER OF PITS:	3 PITS
INSIDE DIAMETER	6 FT
INSIDE HEIGHT	5.23 FT**
TOTAL HEIGHT	6.25 FT
VOLUME INSIDE PIT	443.62 CF
	3318.31 GALLONS
STONE STORAGE VOLUME	
LENGTH	22 FT
WIDTH	10 FT
DEPTH BELOW PITS	2 FT
OUTSIDE DIAM. OF PIT	6.5 FT
STONE BELOW PITS	176 CF
	1316.48 GALLONS
STONE OUTSIDE PITS	251.98 CF
	1884.83 GALLONS
TOTAL STONE	3201.31 GALLONS
PITS AND STONE CAPACITY:	
PITS	3318.31
STONE	3201.31
STORAGE VOLUME PROVIDED	**6519.62 GALLONS**

ASSUMED STONE VOIDS = 40%

** - HEIGHT REDUCED DUE TO 0.44' VARIATION IN TANK ELEVATIONS

Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

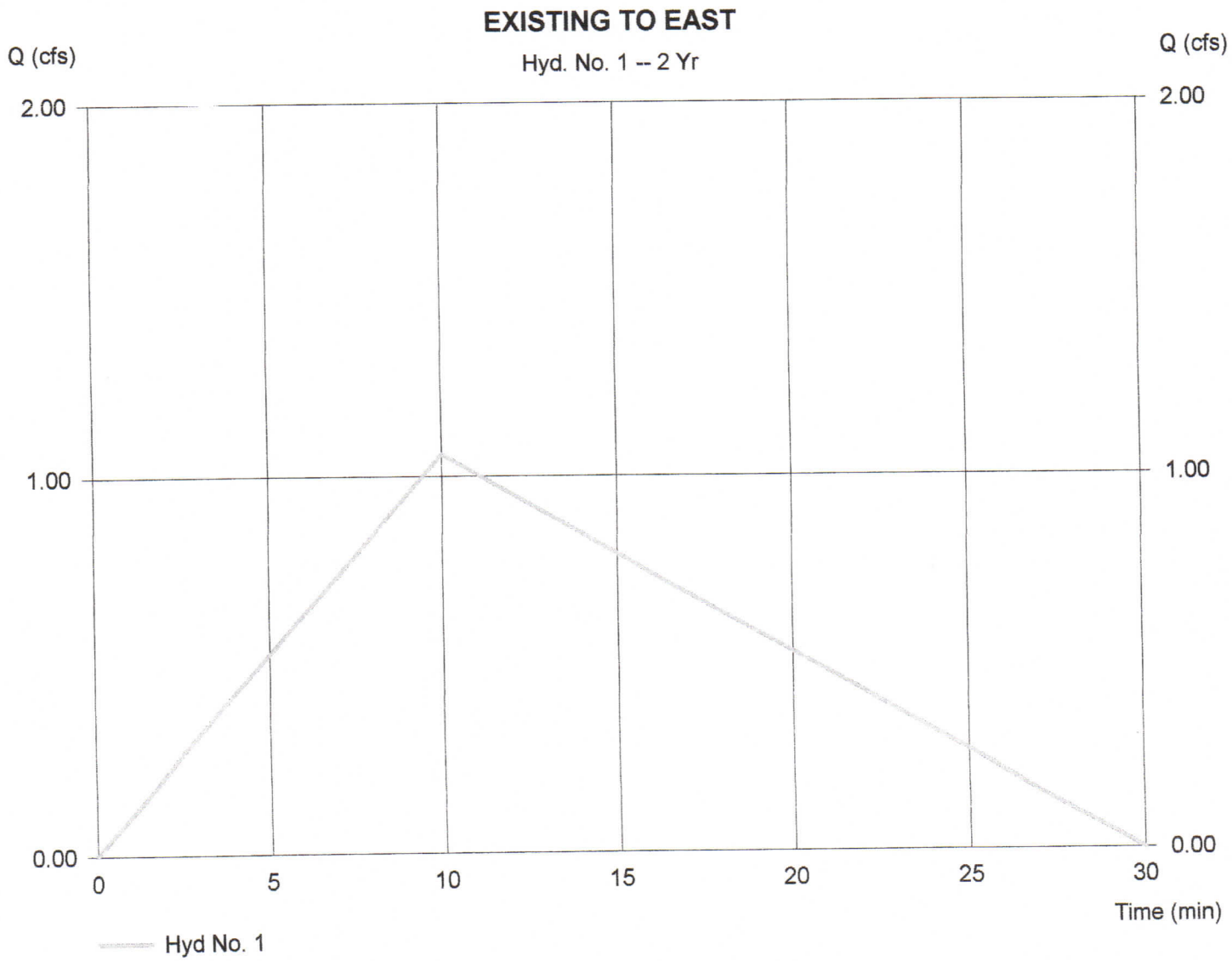
Monday, Jan 13 2014, 11:10 AM

Hyd. No. 1

EXISTING TO EAST

Hydrograph type	= Rational	Peak discharge	= 1.06 cfs
Storm frequency	= 2 yrs	Time interval	= 1 min
Drainage area	= 0.480 ac	Runoff coeff.	= 0.62
Intensity	= 3.556 in/hr	Tc by User	= 10.00 min
IDF Curve	= rockland.IDF	Asc/Rec limb fact	= 1/2

Hydrograph Volume = 952 cuft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

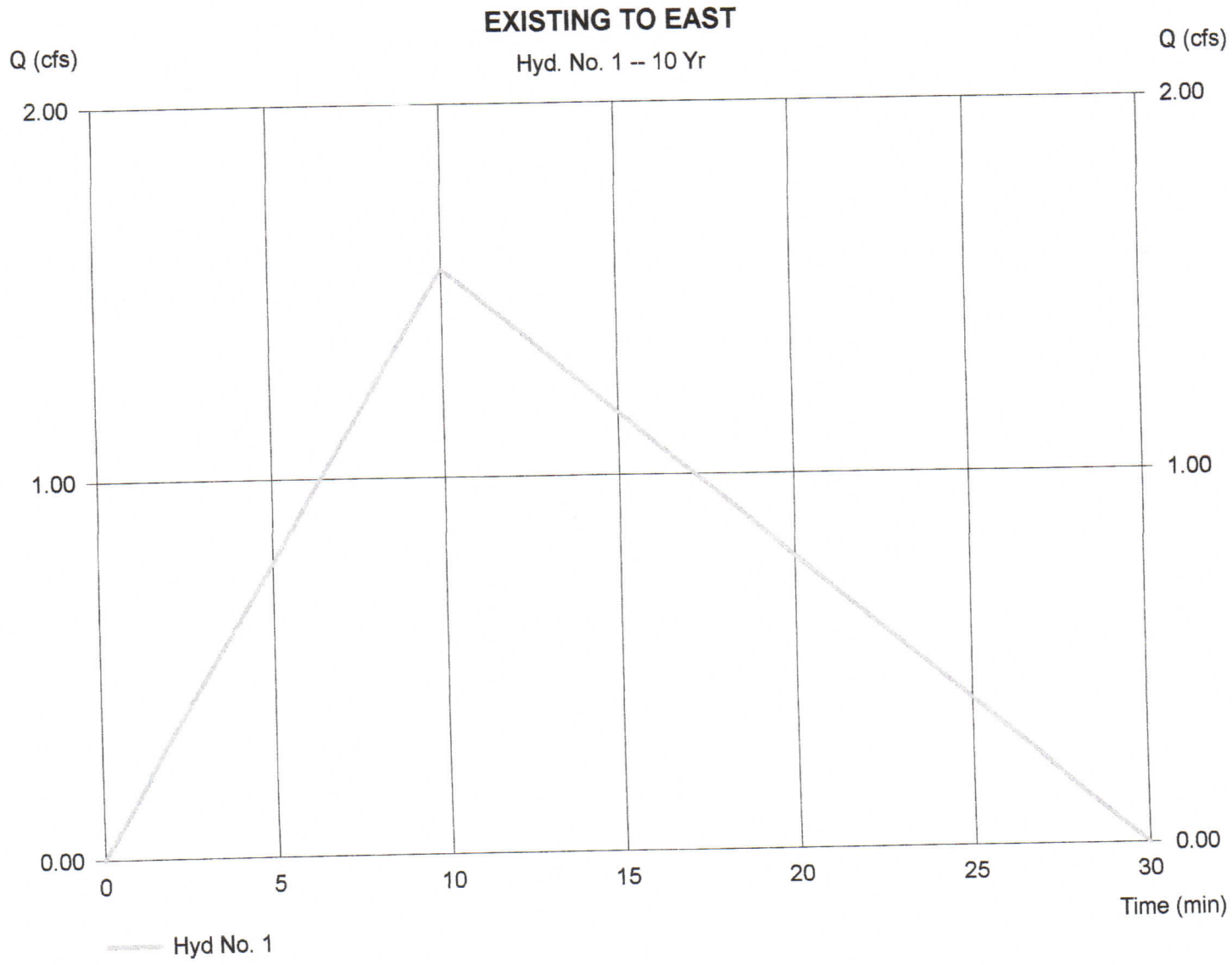
Monday, Jan 13 2014, 11:11 AM

Hyd. No. 1

EXISTING TO EAST

Hydrograph type	= Rational	Peak discharge	= 1.56 cfs
Storm frequency	= 10 yrs	Time interval	= 1 min
Drainage area	= 0.480 ac	Runoff coeff.	= 0.62
Intensity	= 5.240 in/hr	Tc by User	= 10.00 min
IDF Curve	= rockland.IDF	Asc/Rec limb fact	= 1/2

Hydrograph Volume = 1,403 cuft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

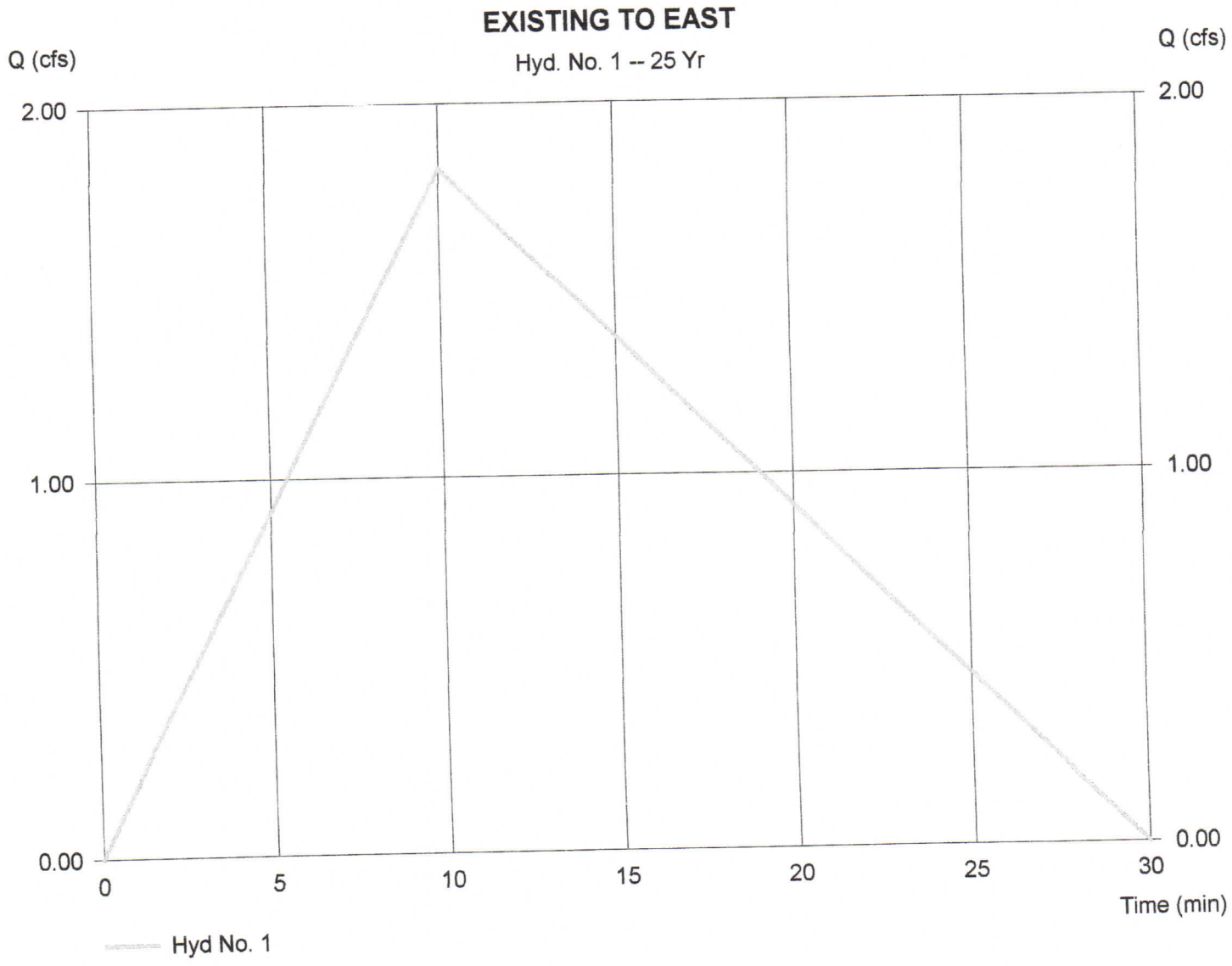
Monday, Jan 13 2014, 11:11 AM

Hyd. No. 1

EXISTING TO EAST

Hydrograph type	= Rational	Peak discharge	= 1.83 cfs
Storm frequency	= 25 yrs	Time interval	= 1 min
Drainage area	= 0.480 ac	Runoff coeff.	= 0.62
Intensity	= 6.135 in/hr	Tc by User	= 10.00 min
IDF Curve	= rockland.IDF	Asc/Rec limb fact	= 1/2

Hydrograph Volume = 1,643 cuft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

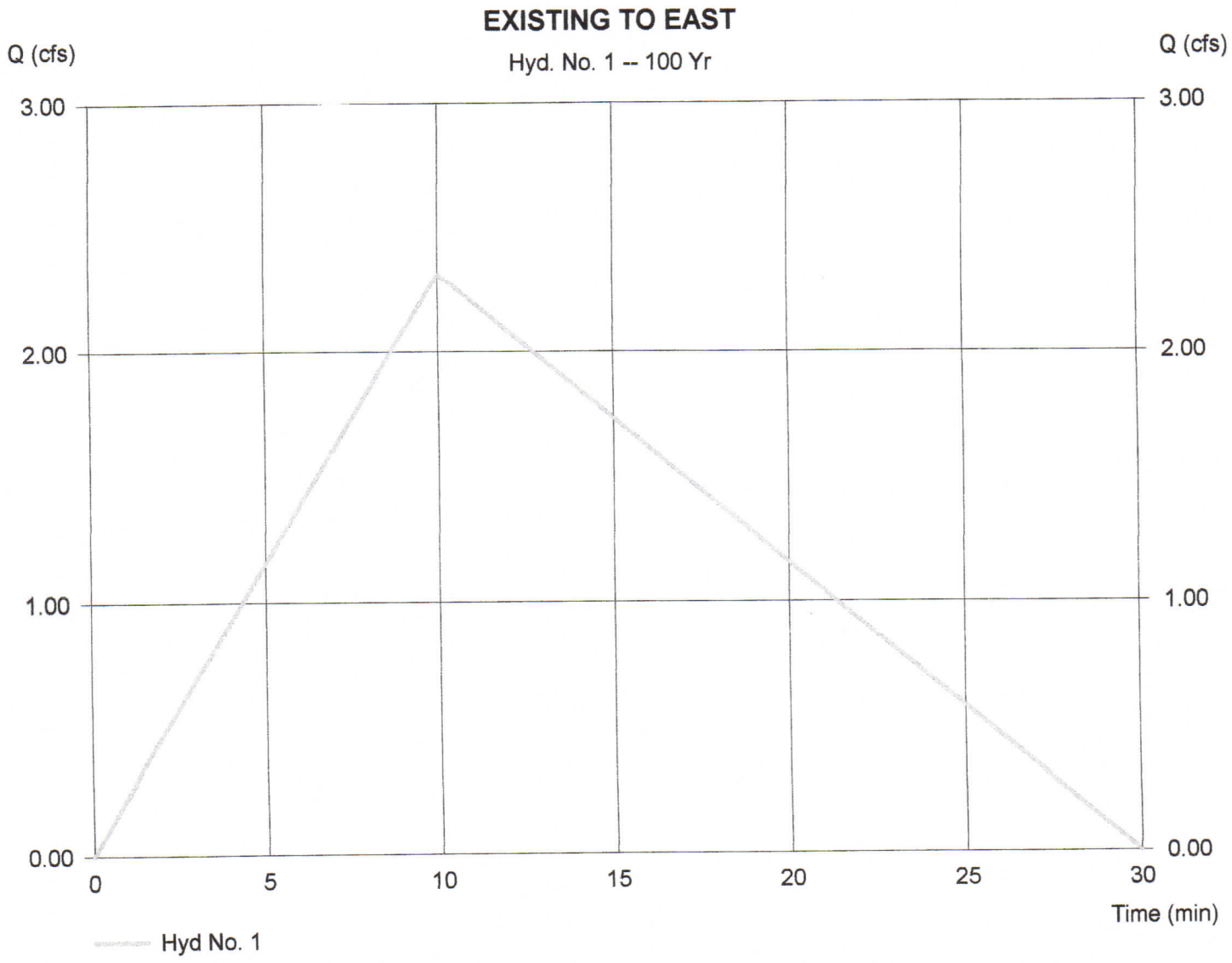
Monday, Jan 13 2014, 11:11 AM

Hyd. No. 1

EXISTING TO EAST

Hydrograph type	= Rational	Peak discharge	= 2.31 cfs
Storm frequency	= 100 yrs	Time interval	= 1 min
Drainage area	= 0.480 ac	Runoff coeff.	= 0.62
Intensity	= 7.774 in/hr	Tc by User	= 10.00 min
IDF Curve	= rockland.IDF	Asc/Rec limb fact	= 1/2

Hydrograph Volume = 2,082 cuft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

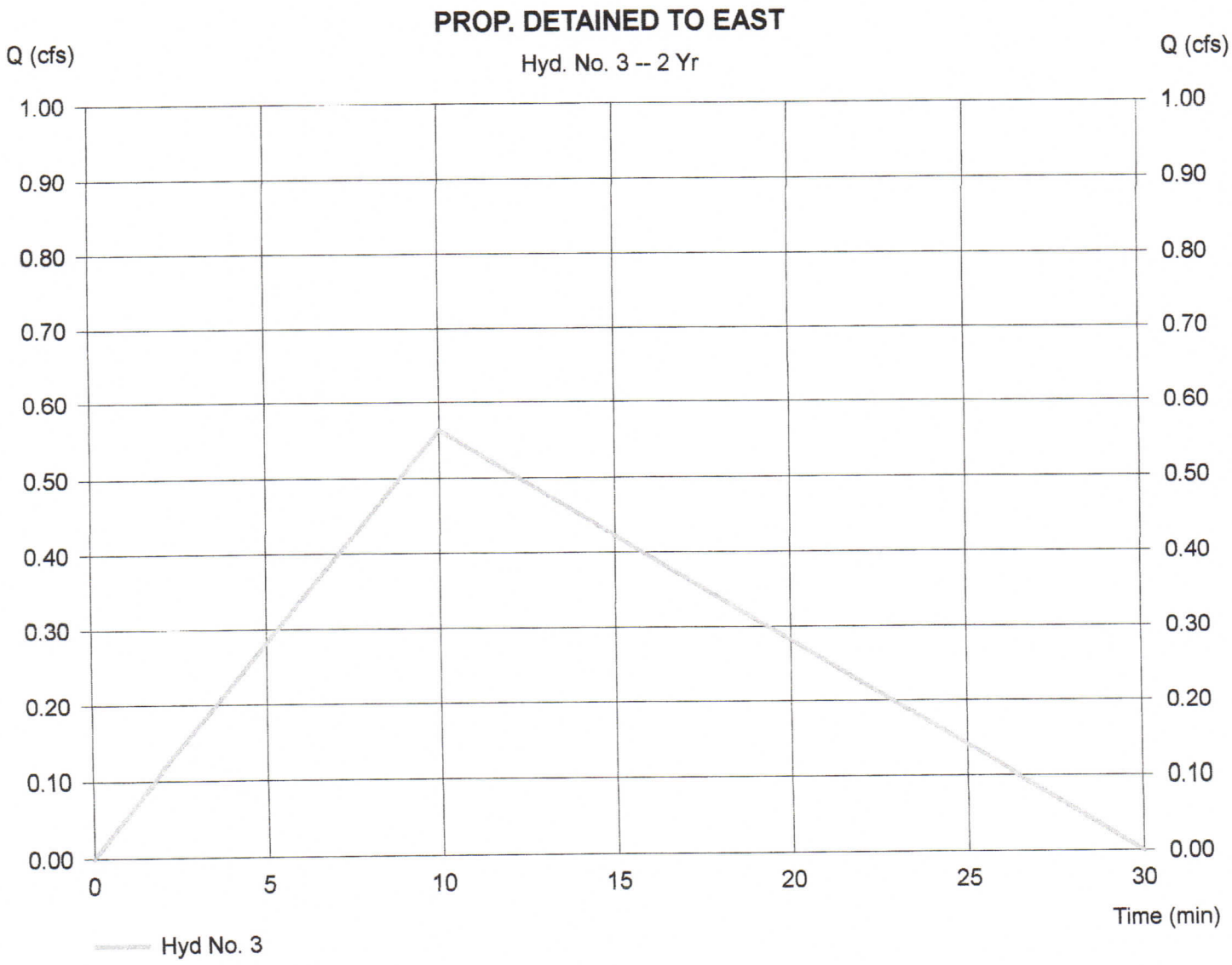
Monday, Jan 13 2014, 11:11 AM

Hyd. No. 3

PROP. DETAINED TO EAST

Hydrograph type	= Rational	Peak discharge	= 0.56 cfs
Storm frequency	= 2 yrs	Time interval	= 1 min
Drainage area	= 0.160 ac	Runoff coeff.	= 0.99
Intensity	= 3.556 in/hr	Tc by User	= 10.00 min
IDF Curve	= rockland.IDF	Asc/Rec limb fact	= 1/2

Hydrograph Volume = 507 cuft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

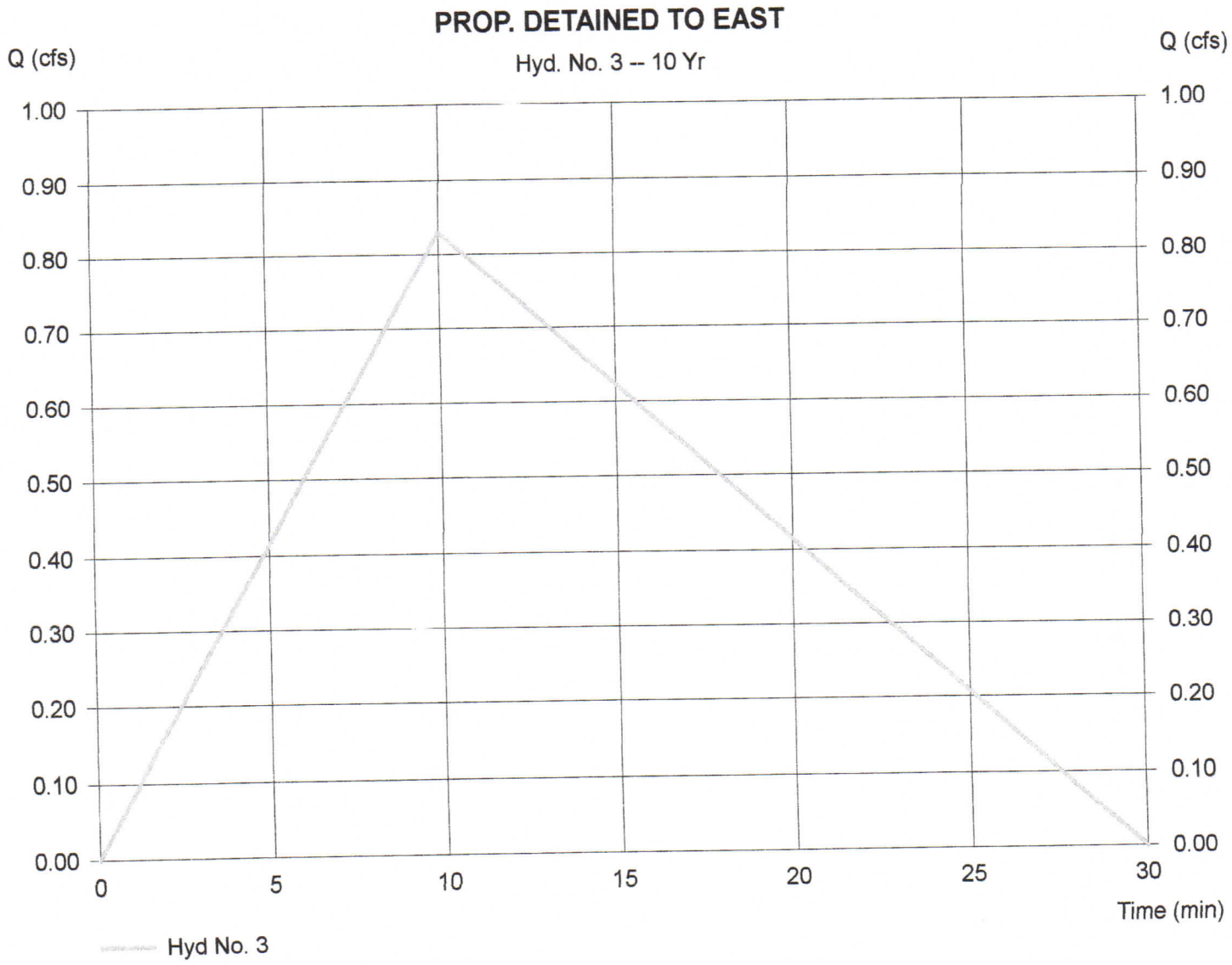
Monday, Jan 13 2014, 11:11 AM

Hyd. No. 3

PROP. DETAINED TO EAST

Hydrograph type	= Rational	Peak discharge	= 0.83 cfs
Storm frequency	= 10 yrs	Time interval	= 1 min
Drainage area	= 0.160 ac	Runoff coeff.	= 0.99
Intensity	= 5.240 in/hr	Tc by User	= 10.00 min
IDF Curve	= rockland.IDF	Asc/Rec limb fact	= 1/2

Hydrograph Volume = 747 cuft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

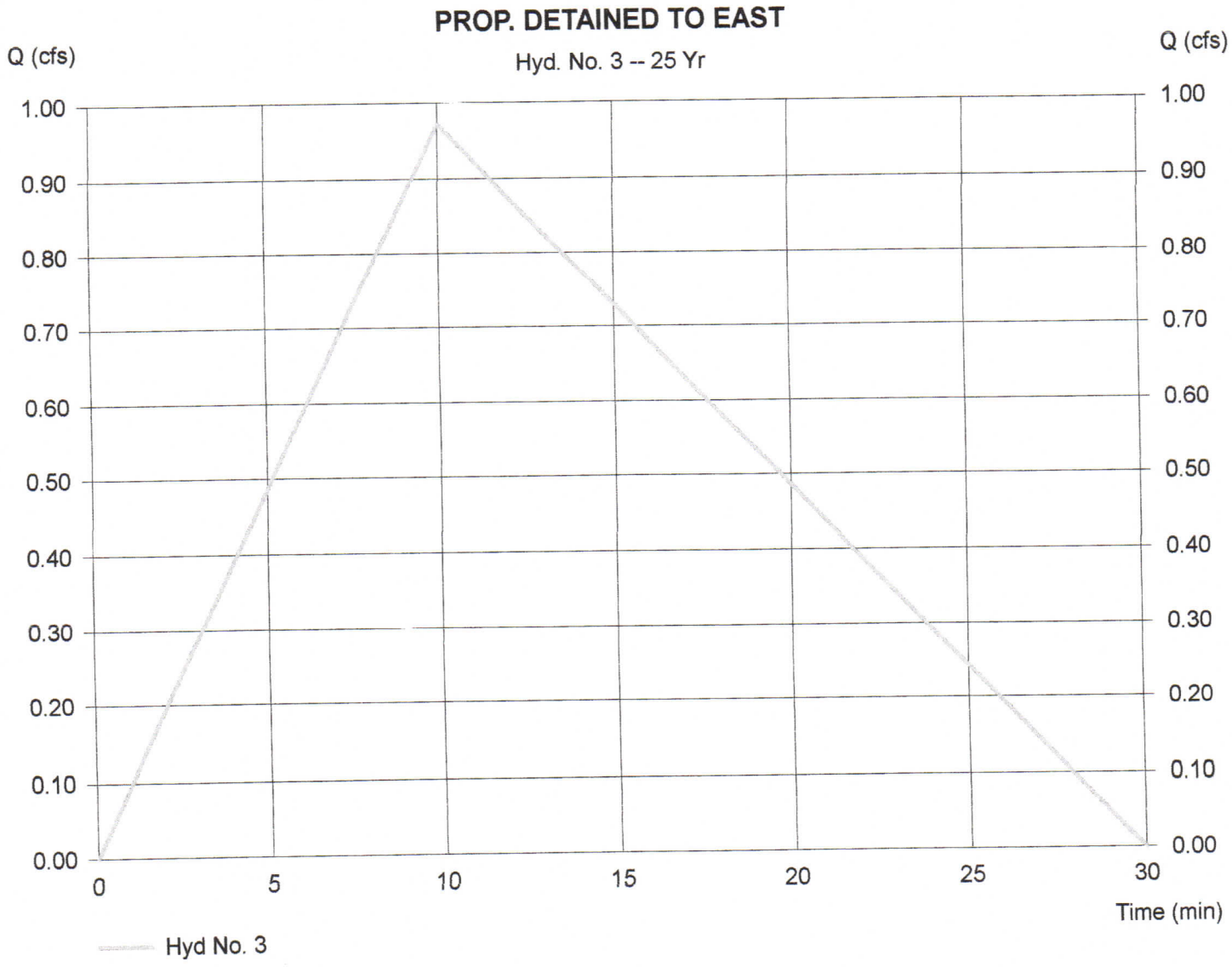
Monday, Jan 13 2014, 11:12 AM

Hyd. No. 3

PROP. DETAINED TO EAST

Hydrograph type	= Rational	Peak discharge	= 0.97 cfs
Storm frequency	= 25 yrs	Time interval	= 1 min
Drainage area	= 0.160 ac	Runoff coeff.	= 0.99
Intensity	= 6.135 in/hr	Tc by User	= 10.00 min
IDF Curve	= rockland.IDF	Asc/Rec limb fact	= 1/2

Hydrograph Volume = 875 cuft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

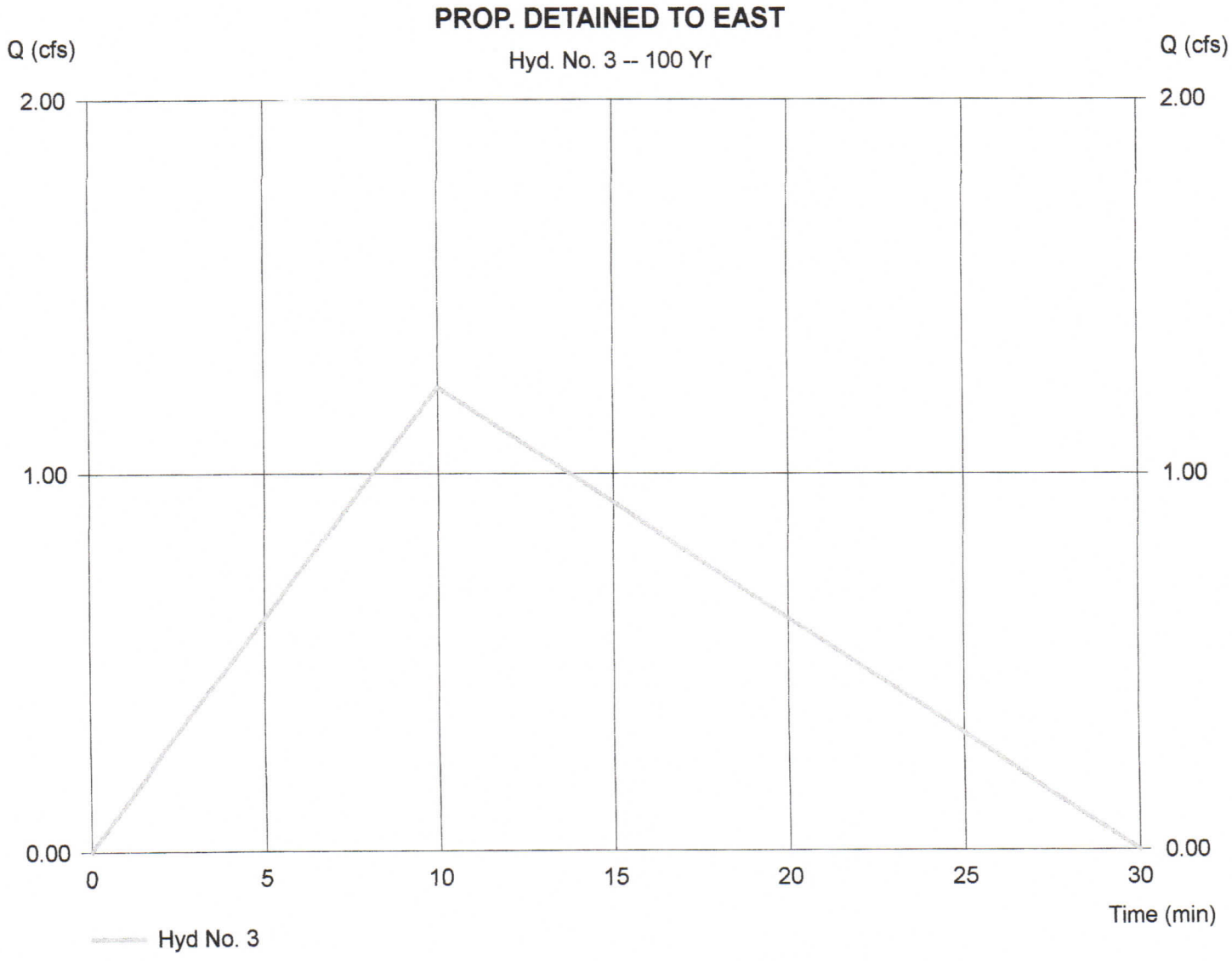
Monday, Jan 13 2014, 11:12 AM

Hyd. No. 3

PROP. DETAINED TO EAST

Hydrograph type	= Rational	Peak discharge	= 1.23 cfs
Storm frequency	= 100 yrs	Time interval	= 1 min
Drainage area	= 0.160 ac	Runoff coeff.	= 0.99
Intensity	= 7.774 in/hr	Tc by User	= 10.00 min
IDF Curve	= rockland.IDF	Asc/Rec limb fact	= 1/2

Hydrograph Volume = 1,108 cuft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

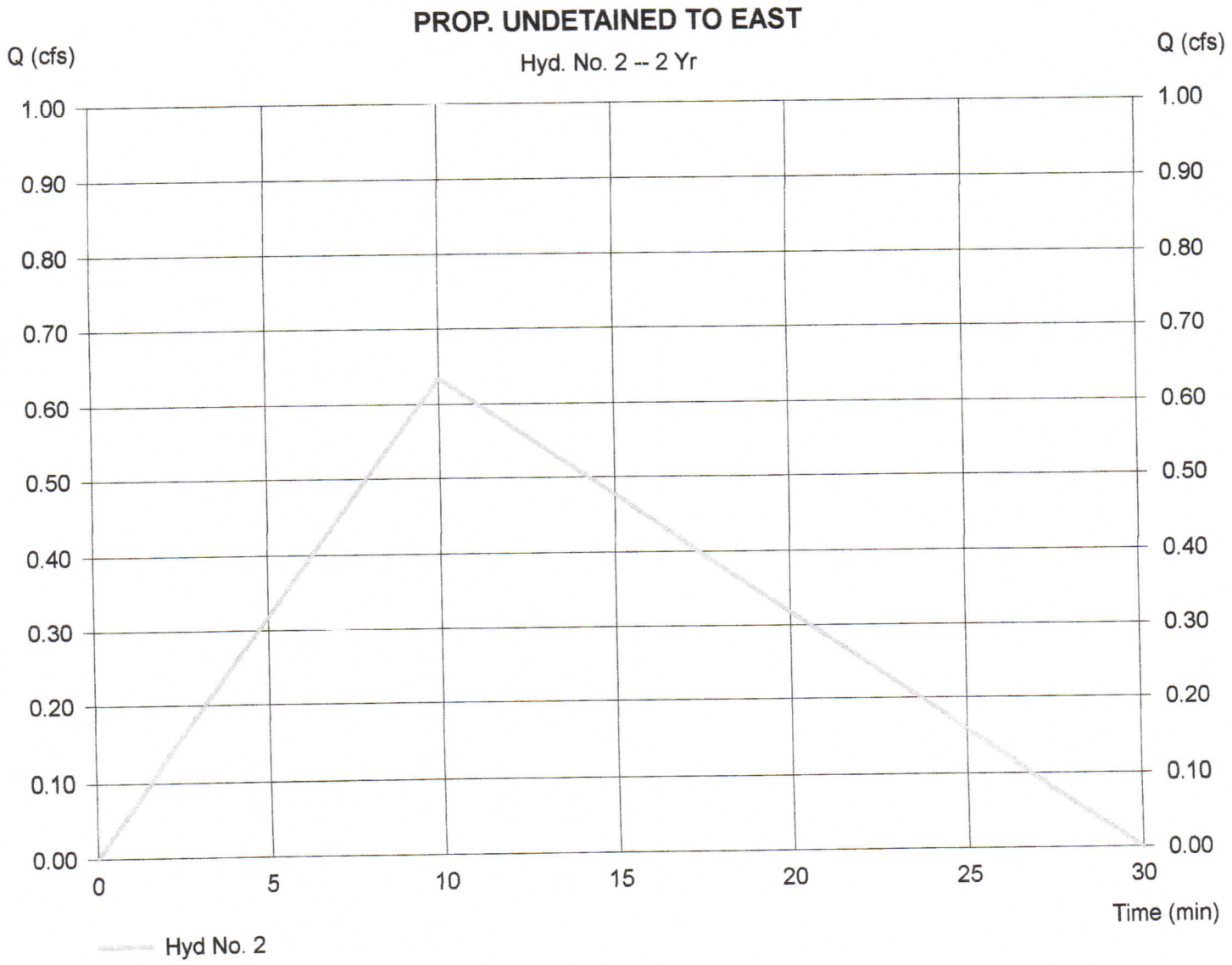
Monday, Jan 13 2014, 11:11 AM

Hyd. No. 2

PROP. UNDETAINED TO EAST

Hydrograph type	= Rational	Peak discharge	= 0.64 cfs
Storm frequency	= 2 yrs	Time interval	= 1 min
Drainage area	= 0.380 ac	Runoff coeff.	= 0.47
Intensity	= 3.556 in/hr	Tc by User	= 10.00 min
IDF Curve	= rockland.IDF	Asc/Rec limb fact	= 1/2

Hydrograph Volume = 572 cuft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

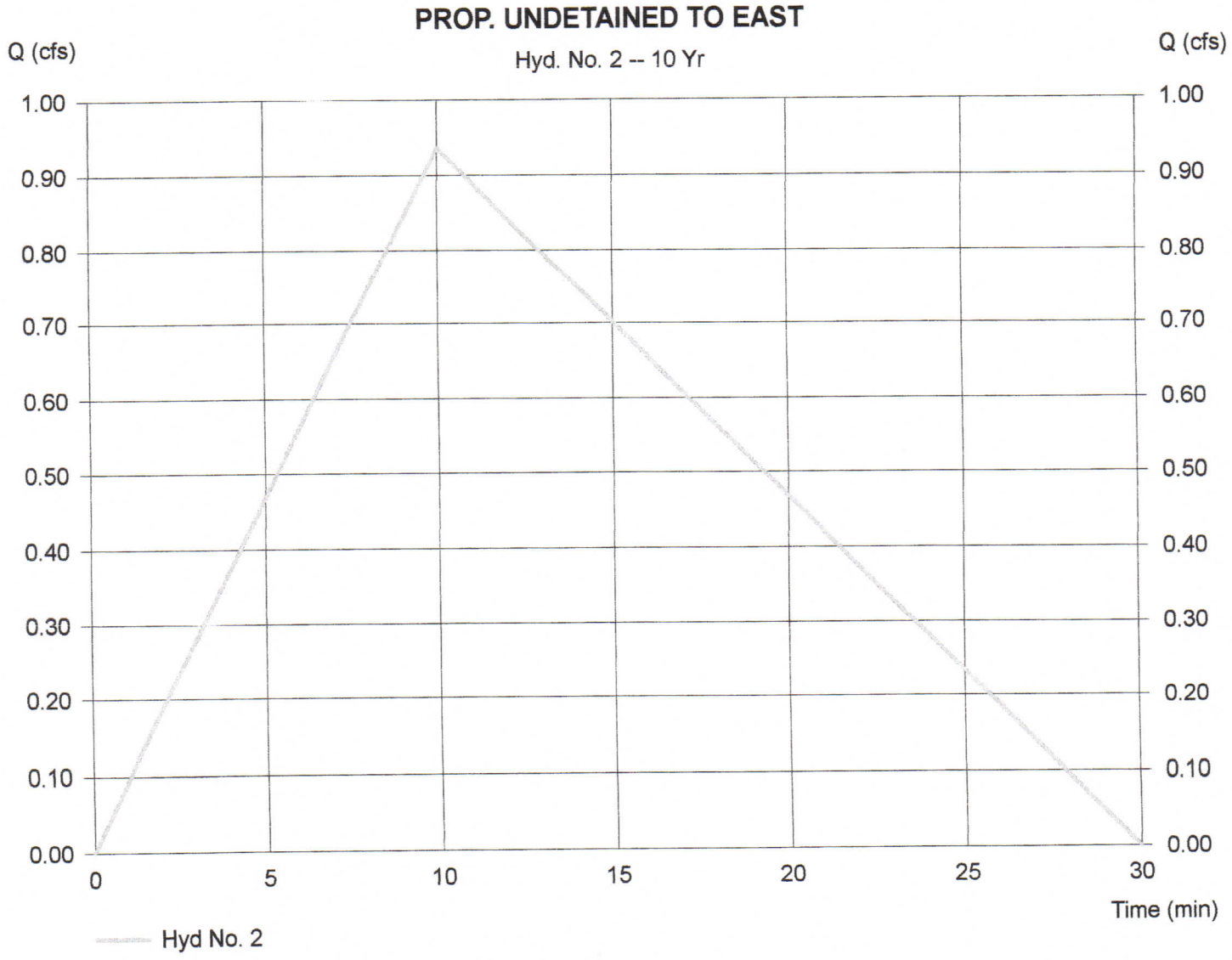
Monday, Jan 13 2014, 11:11 AM

Hyd. No. 2

PROP. UNDETAINED TO EAST

Hydrograph type	= Rational	Peak discharge	= 0.94 cfs
Storm frequency	= 10 yrs	Time interval	= 1 min
Drainage area	= 0.380 ac	Runoff coeff.	= 0.47
Intensity	= 5.240 in/hr	Tc by User	= 10.00 min
IDF Curve	= rockland.IDF	Asc/Rec limb fact	= 1/2

Hydrograph Volume = 842 cuft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

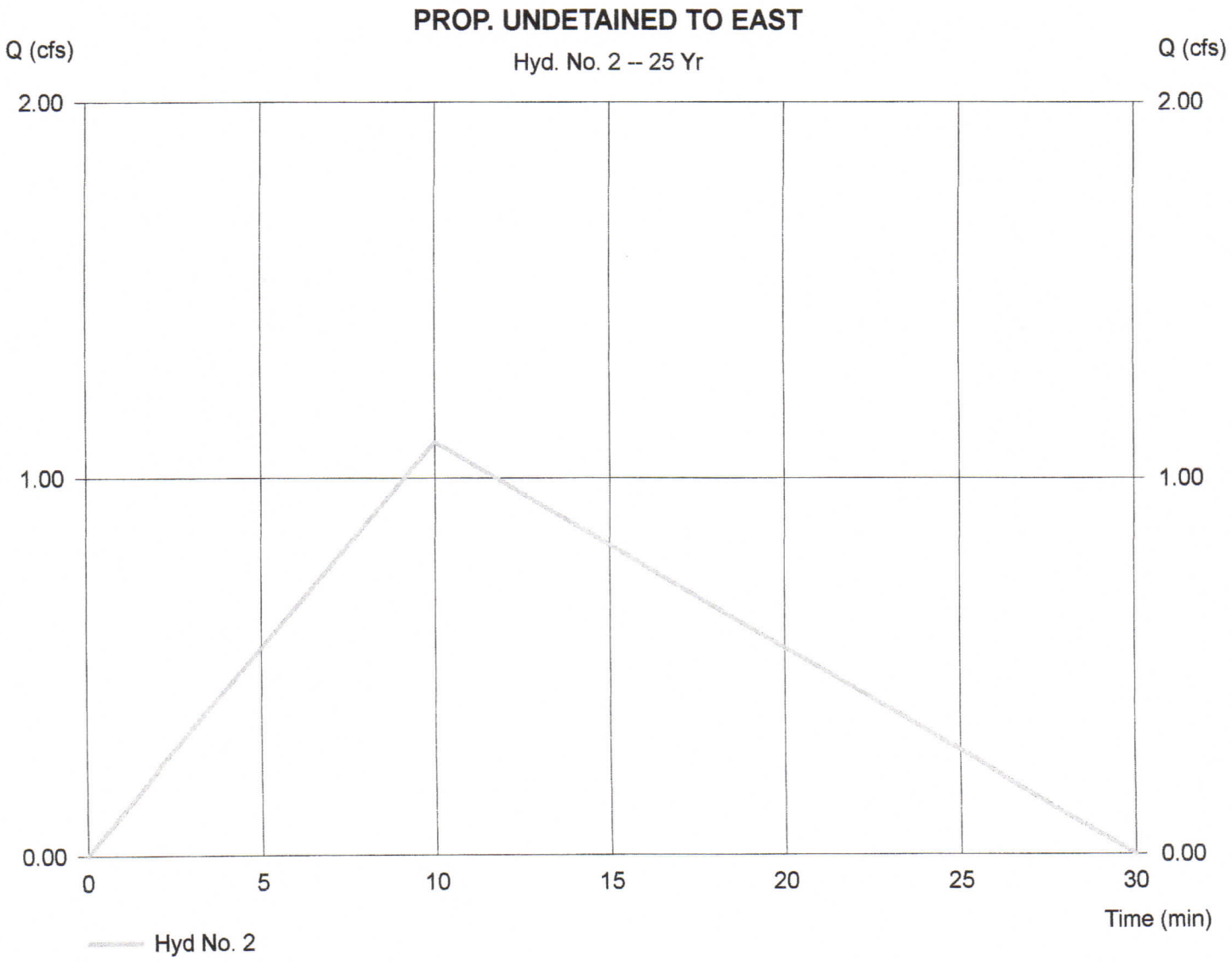
Monday, Jan 13 2014, 11:11 AM

Hyd. No. 2

PROP. UNDETAINED TO EAST

Hydrograph type	= Rational	Peak discharge	= 1.10 cfs
Storm frequency	= 25 yrs	Time interval	= 1 min
Drainage area	= 0.380 ac	Runoff coeff.	= 0.47
Intensity	= 6.135 in/hr	Tc by User	= 10.00 min
IDF Curve	= rockland.IDF	Asc/Rec limb fact	= 1/2

Hydrograph Volume = 986 cuft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

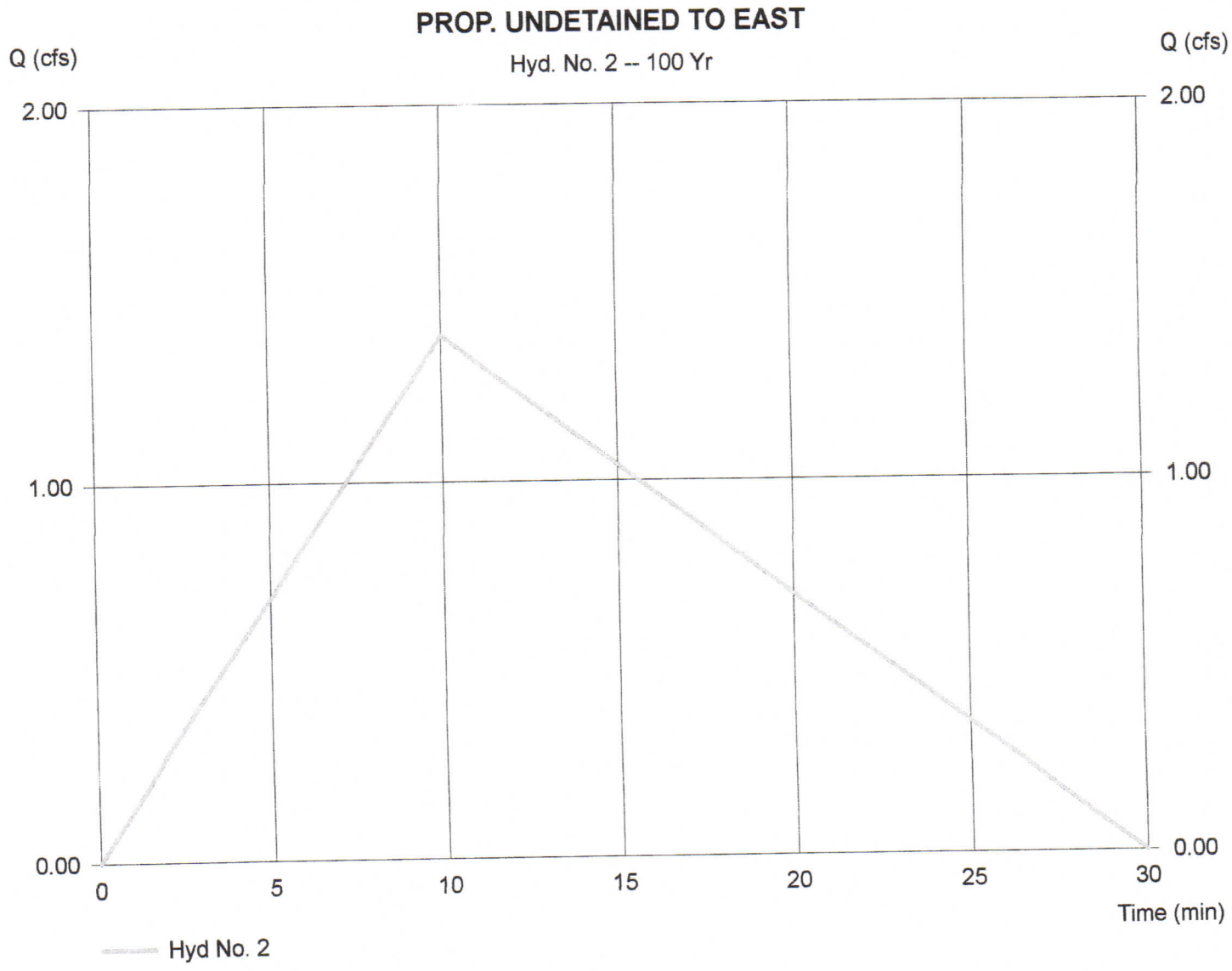
Monday, Jan 13 2014, 11:11 AM

Hyd. No. 2

PROP. UNDETAINED TO EAST

Hydrograph type	= Rational	Peak discharge	= 1.39 cfs
Storm frequency	= 100 yrs	Time interval	= 1 min
Drainage area	= 0.380 ac	Runoff coeff.	= 0.47
Intensity	= 7.774 in/hr	Tc by User	= 10.00 min
IDF Curve	= rockland.IDF	Asc/Rec limb fact	= 1/2

Hydrograph Volume = 1,250 cuft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

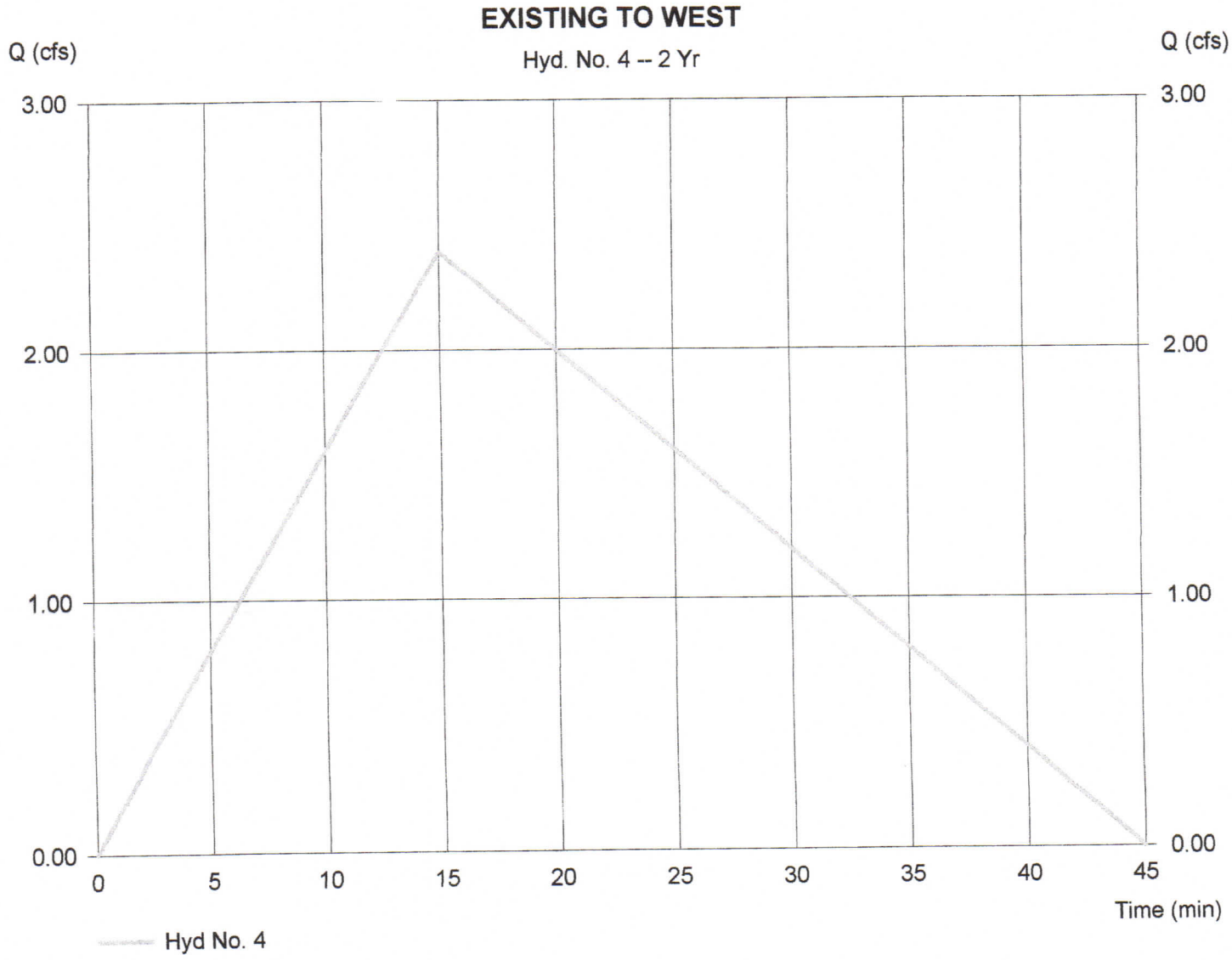
Monday, Jan 13 2014, 11:23 AM

Hyd. No. 4

EXISTING TO WEST

Hydrograph type	= Rational	Peak discharge	= 2.40 cfs
Storm frequency	= 2 yrs	Time interval	= 1 min
Drainage area	= 1.550 ac	Runoff coeff.	= 0.51
Intensity	= 3.031 in/hr	Tc by User	= 15.00 min
IDF Curve	= rockland.IDF	Asc/Rec limb fact	= 1/2

Hydrograph Volume = 3,235 cuft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

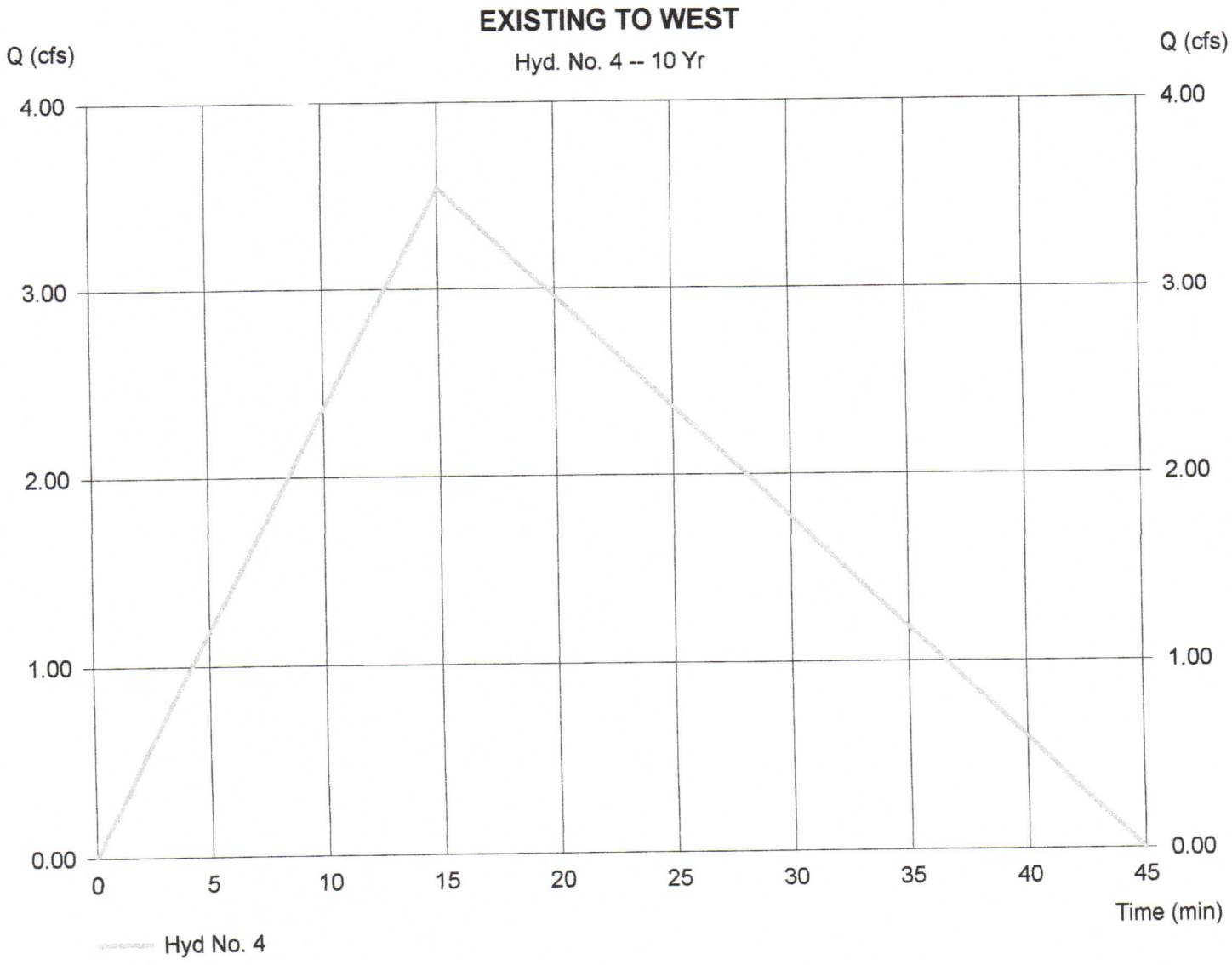
Monday, Jan 13 2014, 11:24 AM

Hyd. No. 4

EXISTING TO WEST

Hydrograph type	= Rational	Peak discharge	= 3.55 cfs
Storm frequency	= 10 yrs	Time interval	= 1 min
Drainage area	= 1.550 ac	Runoff coeff.	= 0.51
Intensity	= 4.491 in/hr	Tc by User	= 15.00 min
IDF Curve	= rockland.IDF	Asc/Rec limb fact	= 1/2

Hydrograph Volume = 4,792 cuft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

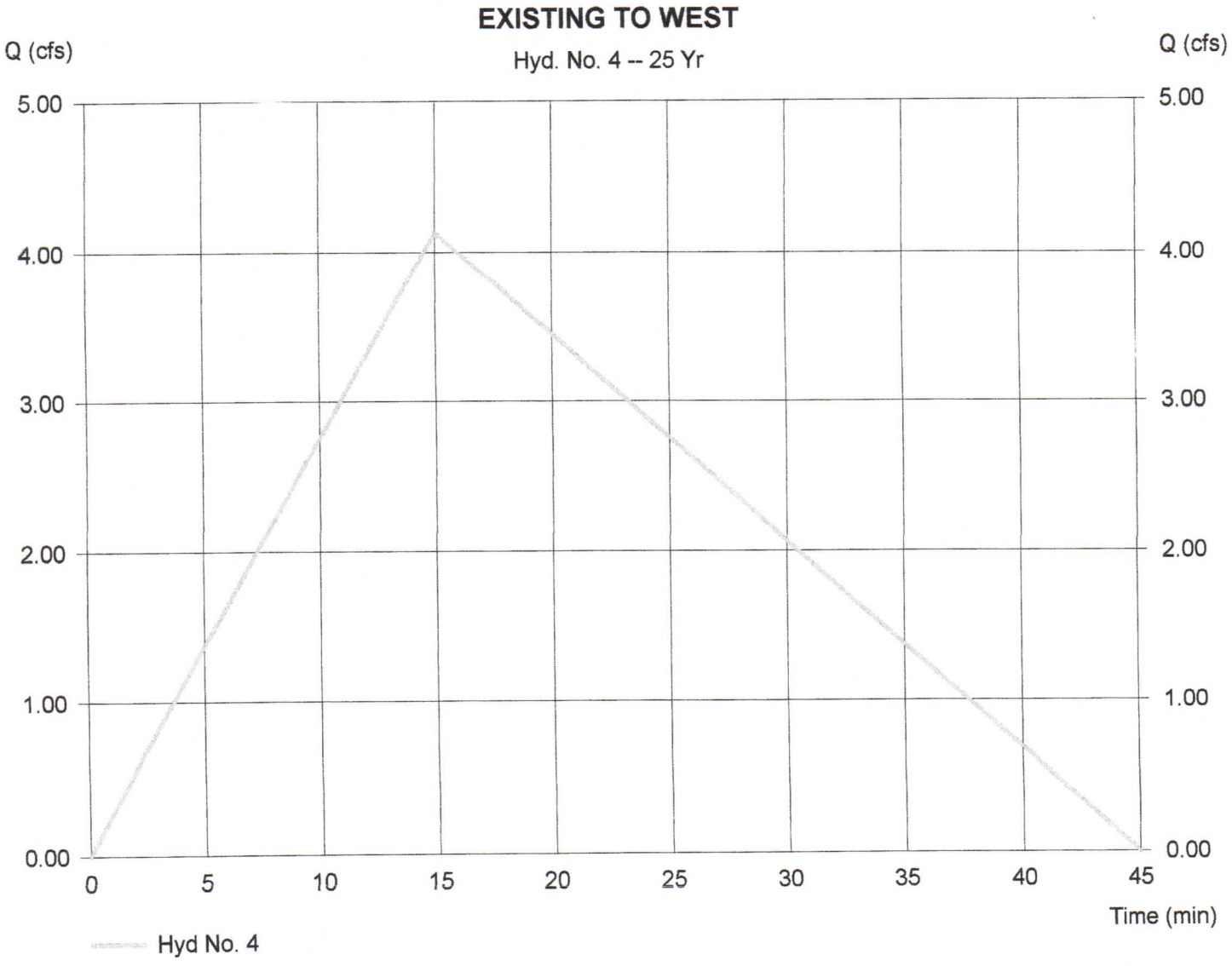
Monday, Jan 13 2014, 11:24 AM

Hyd. No. 4

EXISTING TO WEST

Hydrograph type	= Rational	Peak discharge	= 4.13 cfs
Storm frequency	= 25 yrs	Time interval	= 1 min
Drainage area	= 1.550 ac	Runoff coeff.	= 0.51
Intensity	= 5.228 in/hr	Tc by User	= 15.00 min
IDF Curve	= rockland.IDF	Asc/Rec limb fact	= 1/2

Hydrograph Volume = 5,579 cuft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

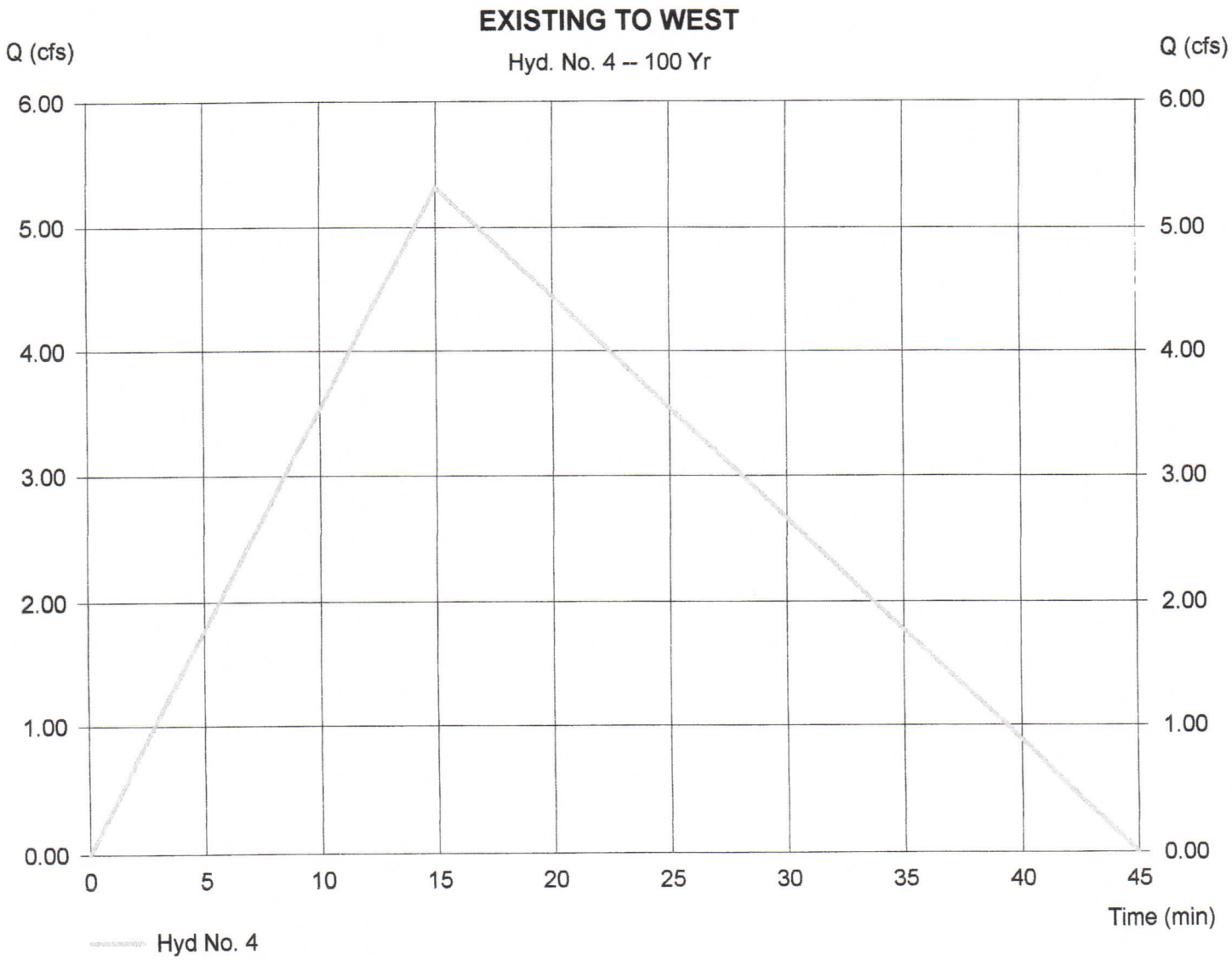
Monday, Jan 13 2014, 11:24 AM

Hyd. No. 4

EXISTING TO WEST

Hydrograph type	= Rational	Peak discharge	= 5.32 cfs
Storm frequency	= 100 yrs	Time interval	= 1 min
Drainage area	= 1.550 ac	Runoff coeff.	= 0.51
Intensity	= 6.730 in/hr	Tc by User	= 15.00 min
IDF Curve	= rockland.IDF	Asc/Rec limb fact	= 1/2

Hydrograph Volume = 7,182 cuft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

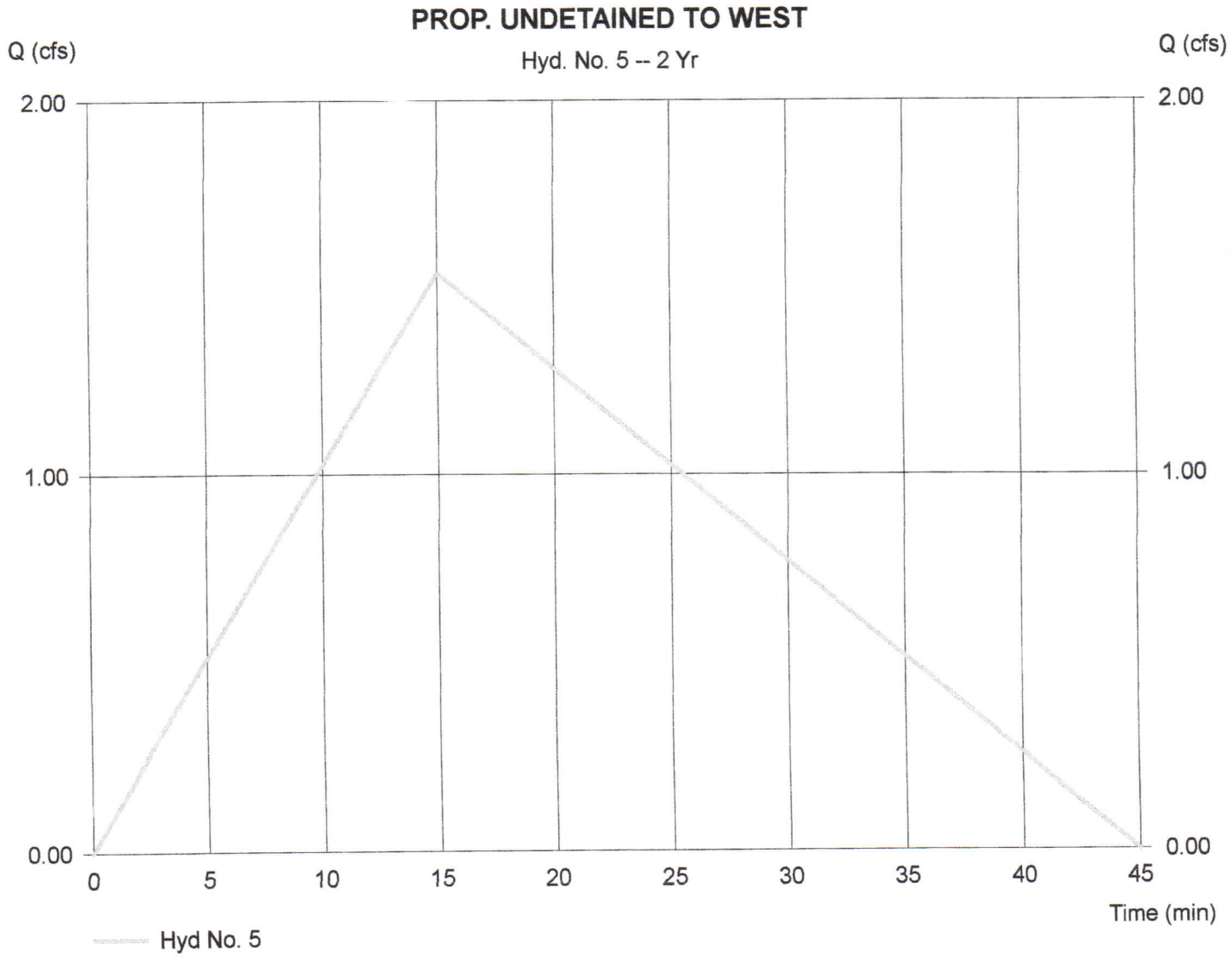
Monday, Jan 13 2014, 11:24 AM

Hyd. No. 5

PROP. UNDETAINED TO WEST

Hydrograph type	= Rational	Peak discharge	= 1.54 cfs
Storm frequency	= 2 yrs	Time interval	= 1 min
Drainage area	= 1.410 ac	Runoff coeff.	= 0.36
Intensity	= 3.031 in/hr	Tc by User	= 15.00 min
IDF Curve	= rockland.IDF	Asc/Rec limb fact	= 1/2

Hydrograph Volume = 2,077 cuft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

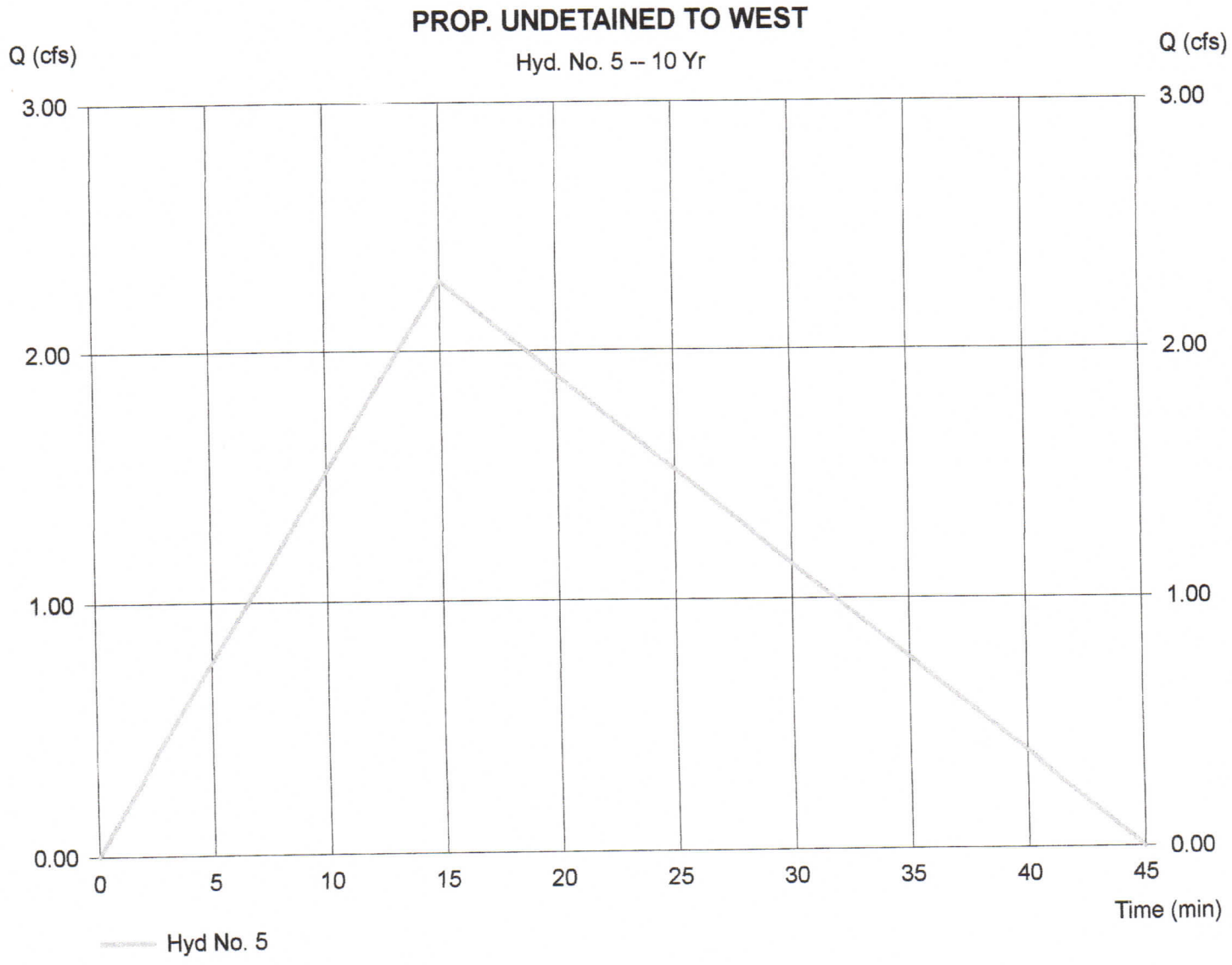
Monday, Jan 13 2014, 11:24 AM

Hyd. No. 5

PROP. UNDETAINED TO WEST

Hydrograph type	= Rational	Peak discharge	= 2.28 cfs
Storm frequency	= 10 yrs	Time interval	= 1 min
Drainage area	= 1.410 ac	Runoff coeff.	= 0.36
Intensity	= 4.491 in/hr	Tc by User	= 15.00 min
IDF Curve	= rockland.IDF	Asc/Rec limb fact	= 1/2

Hydrograph Volume = 3,077 cuft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

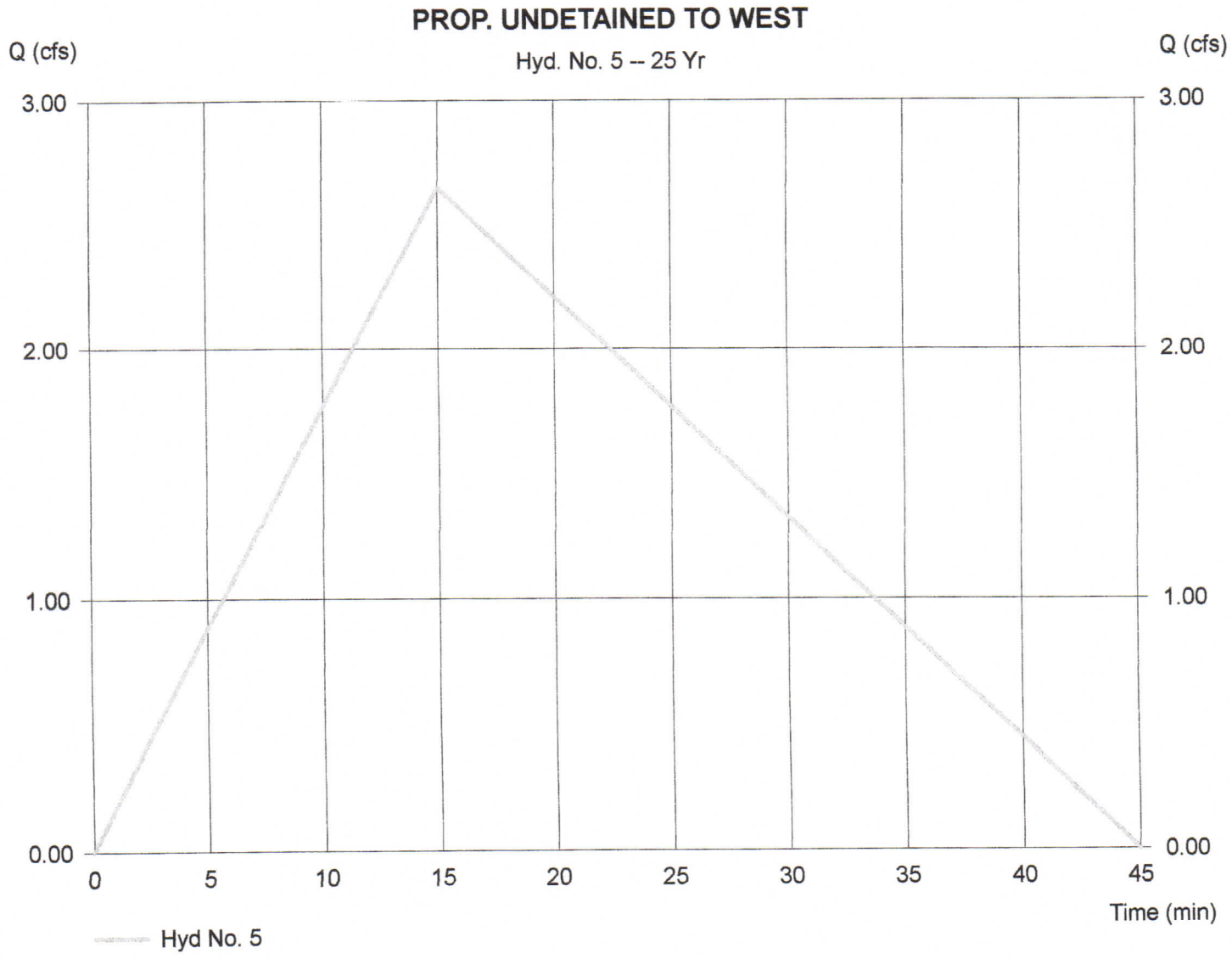
Monday, Jan 13 2014, 11:24 AM

Hyd. No. 5

PROP. UNDETAINED TO WEST

Hydrograph type	= Rational	Peak discharge	= 2.65 cfs
Storm frequency	= 25 yrs	Time interval	= 1 min
Drainage area	= 1.410 ac	Runoff coeff.	= 0.36
Intensity	= 5.228 in/hr	Tc by User	= 15.00 min
IDF Curve	= rockland.IDF	Asc/Rec limb fact	= 1/2

Hydrograph Volume = 3,582 cuft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

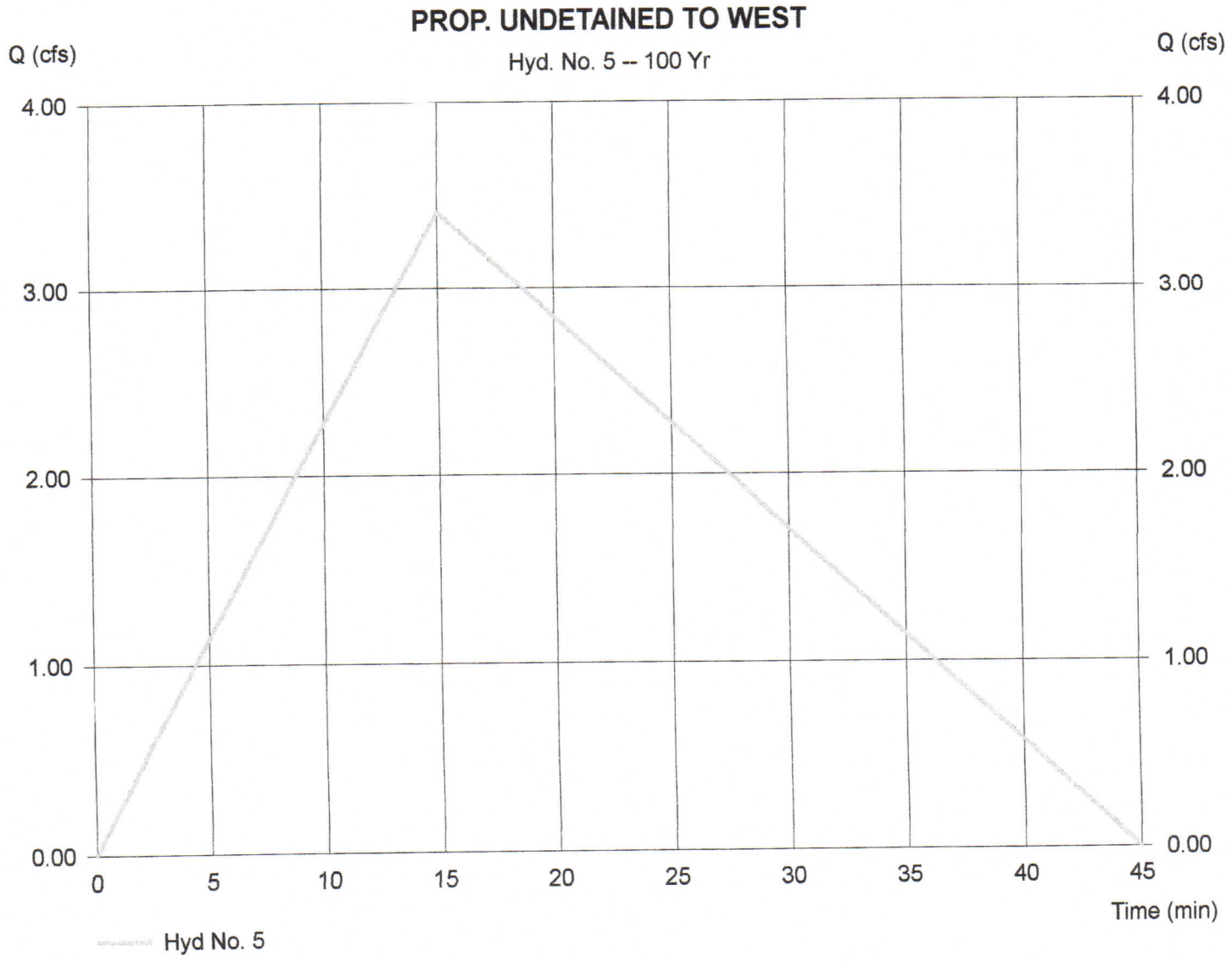
Monday, Jan 13 2014, 11:24 AM

Hyd. No. 5

PROP. UNDETAINED TO WEST

Hydrograph type	= Rational	Peak discharge	= 3.42 cfs
Storm frequency	= 100 yrs	Time interval	= 1 min
Drainage area	= 1.410 ac	Runoff coeff.	= 0.36
Intensity	= 6.730 in/hr	Tc by User	= 15.00 min
IDF Curve	= rockland.IDF	Asc/Rec limb fact	= 1/2

Hydrograph Volume = 4,612 cuft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

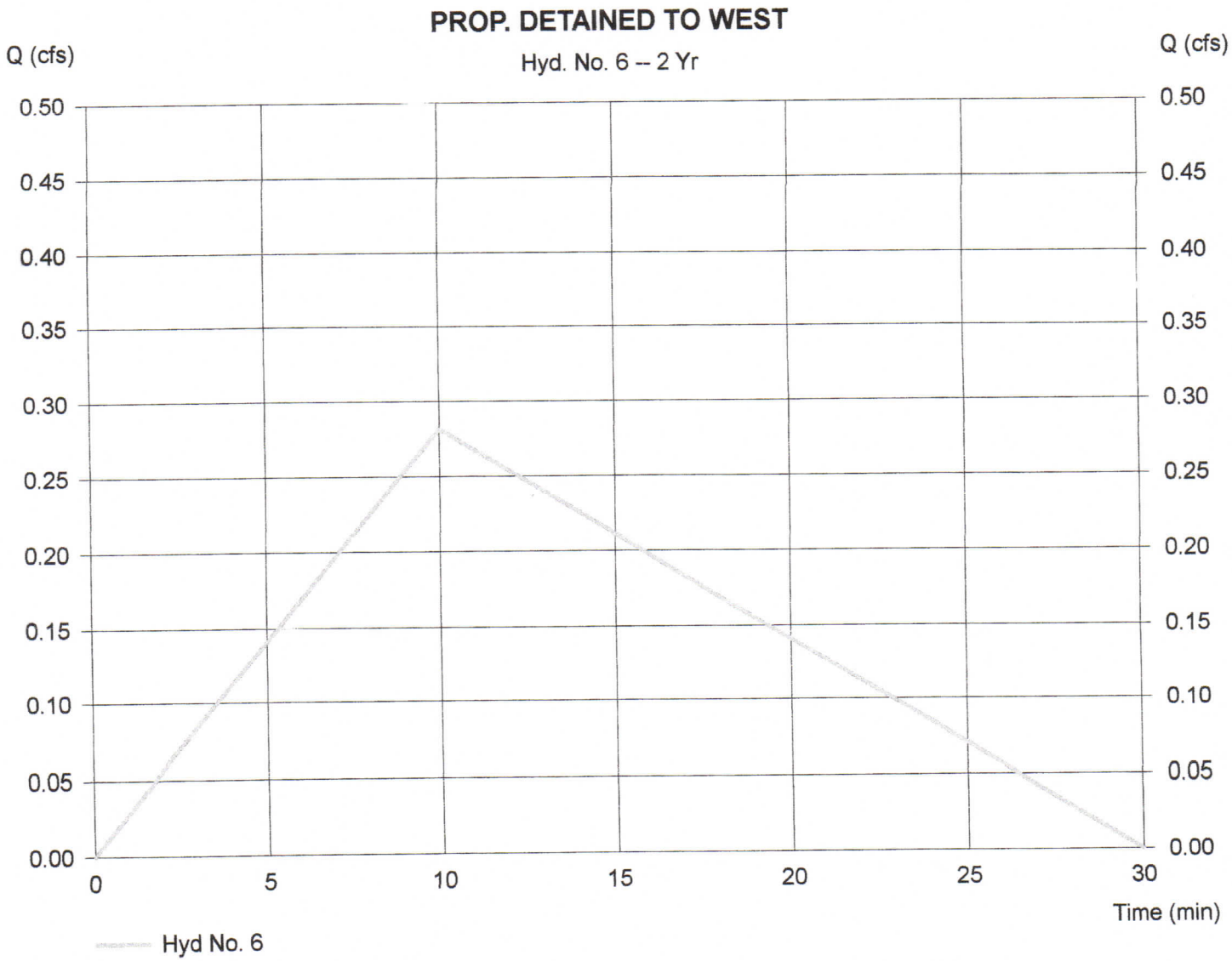
Monday, Jan 13 2014, 11:24 AM

Hyd. No. 6

PROP. DETAINED TO WEST

Hydrograph type	= Rational	Peak discharge	= 0.28 cfs
Storm frequency	= 2 yrs	Time interval	= 1 min
Drainage area	= 0.080 ac	Runoff coeff.	= 0.99
Intensity	= 3.556 in/hr	Tc by User	= 10.00 min
IDF Curve	= rockland.IDF	Asc/Rec limb fact	= 1/2

Hydrograph Volume = 253 cuft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

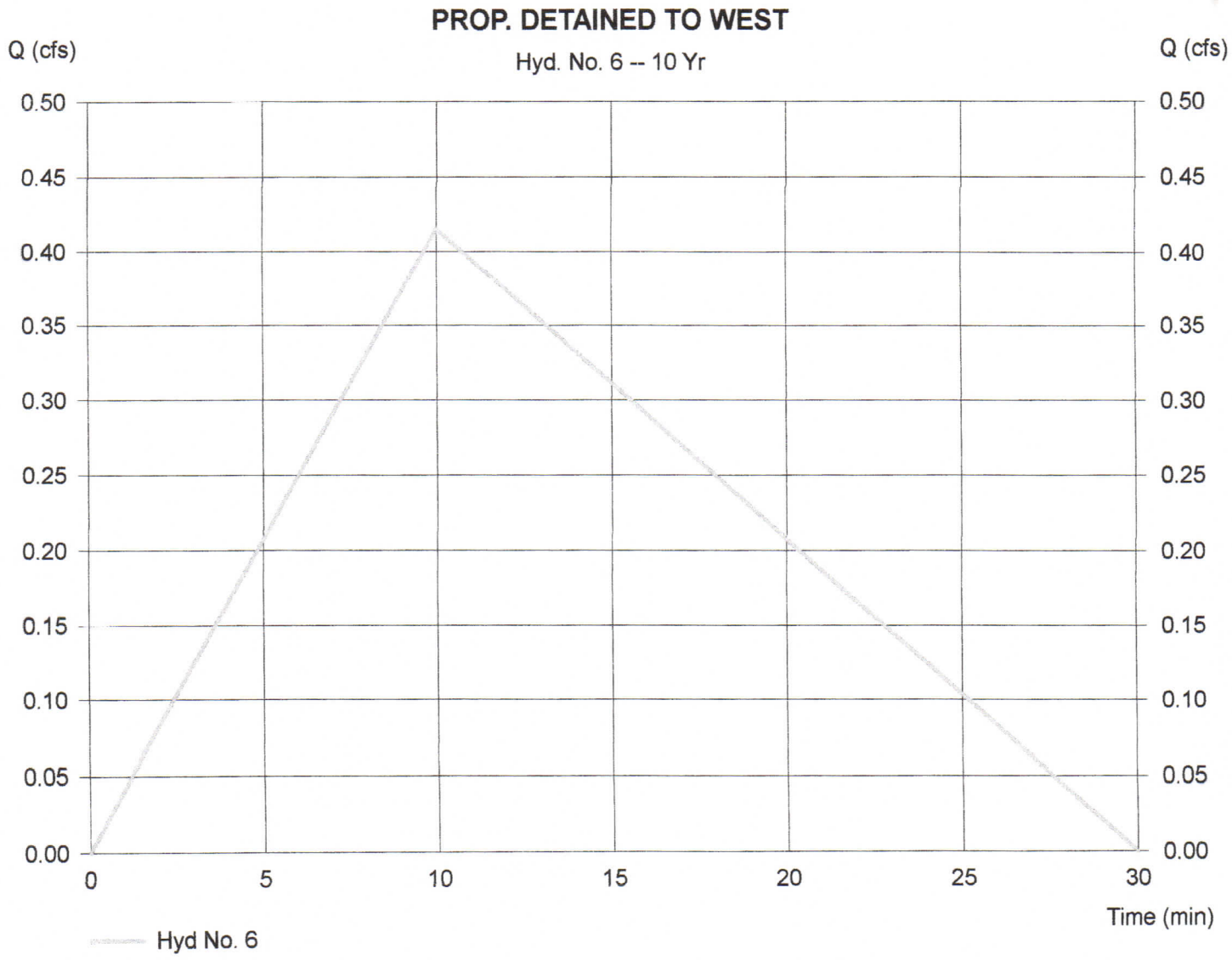
Monday, Jan 13 2014, 11:24 AM

Hyd. No. 6

PROP. DETAINED TO WEST

Hydrograph type	= Rational	Peak discharge	= 0.41 cfs
Storm frequency	= 10 yrs	Time interval	= 1 min
Drainage area	= 0.080 ac	Runoff coeff.	= 0.99
Intensity	= 5.240 in/hr	Tc by User	= 10.00 min
IDF Curve	= rockland.IDF	Asc/Rec limb fact	= 1/2

Hydrograph Volume = 373 cuft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

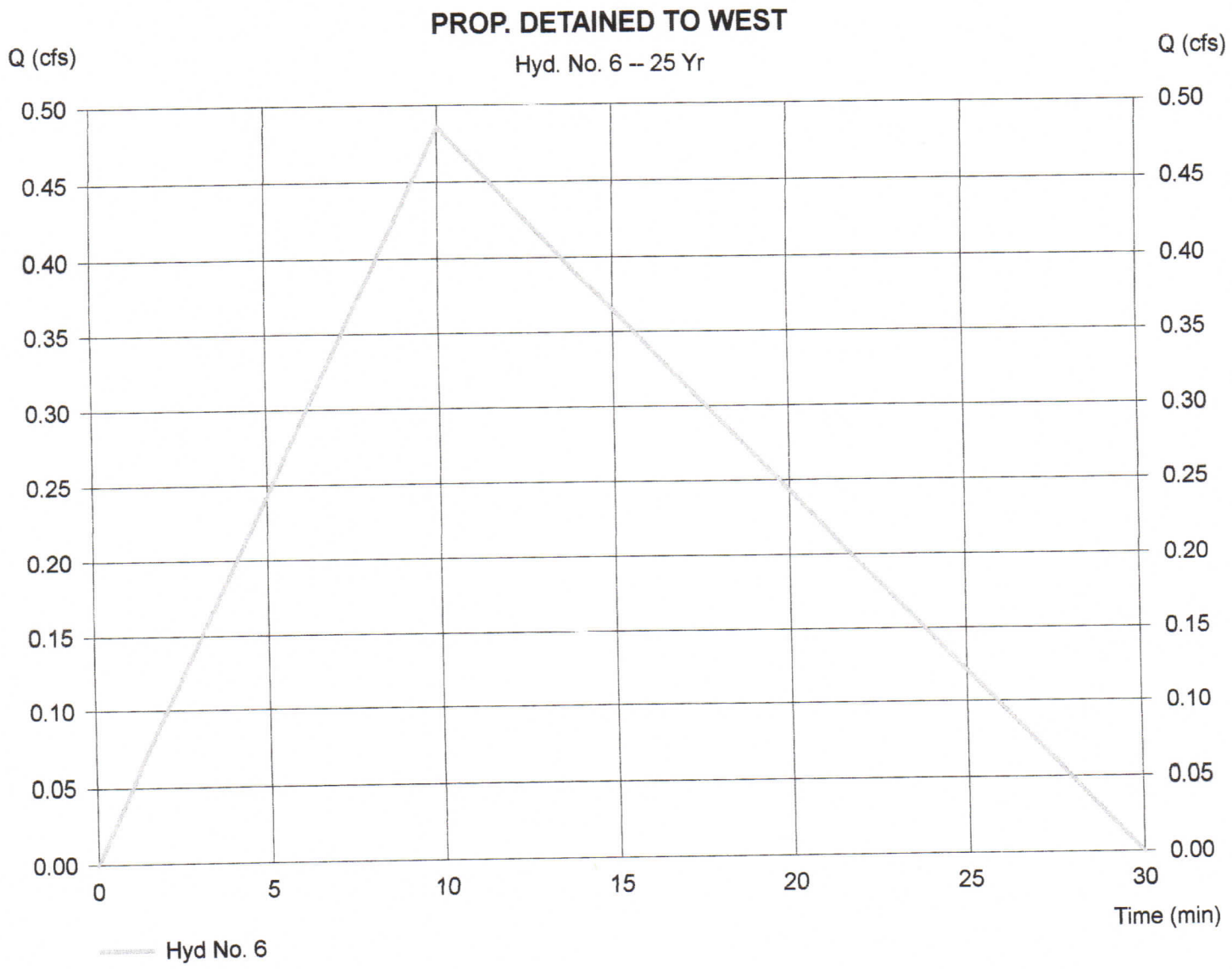
Monday, Jan 13 2014, 11:24 AM

Hyd. No. 6

PROP. DETAINED TO WEST

Hydrograph type	= Rational	Peak discharge	= 0.49 cfs
Storm frequency	= 25 yrs	Time interval	= 1 min
Drainage area	= 0.080 ac	Runoff coeff.	= 0.99
Intensity	= 6.135 in/hr	Tc by User	= 10.00 min
IDF Curve	= rockland.IDF	Asc/Rec limb fact	= 1/2

Hydrograph Volume = 437 cuft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

Monday, Jan 13 2014, 11:24 AM

Hyd. No. 6

PROP. DETAINED TO WEST

Hydrograph type	= Rational	Peak discharge	= 0.62 cfs
Storm frequency	= 100 yrs	Time interval	= 1 min
Drainage area	= 0.080 ac	Runoff coeff.	= 0.99
Intensity	= 7.774 in/hr	Tc by User	= 10.00 min
IDF Curve	= rockland.IDF	Asc/Rec limb fact	= 1/2

Hydrograph Volume = 554 cuft

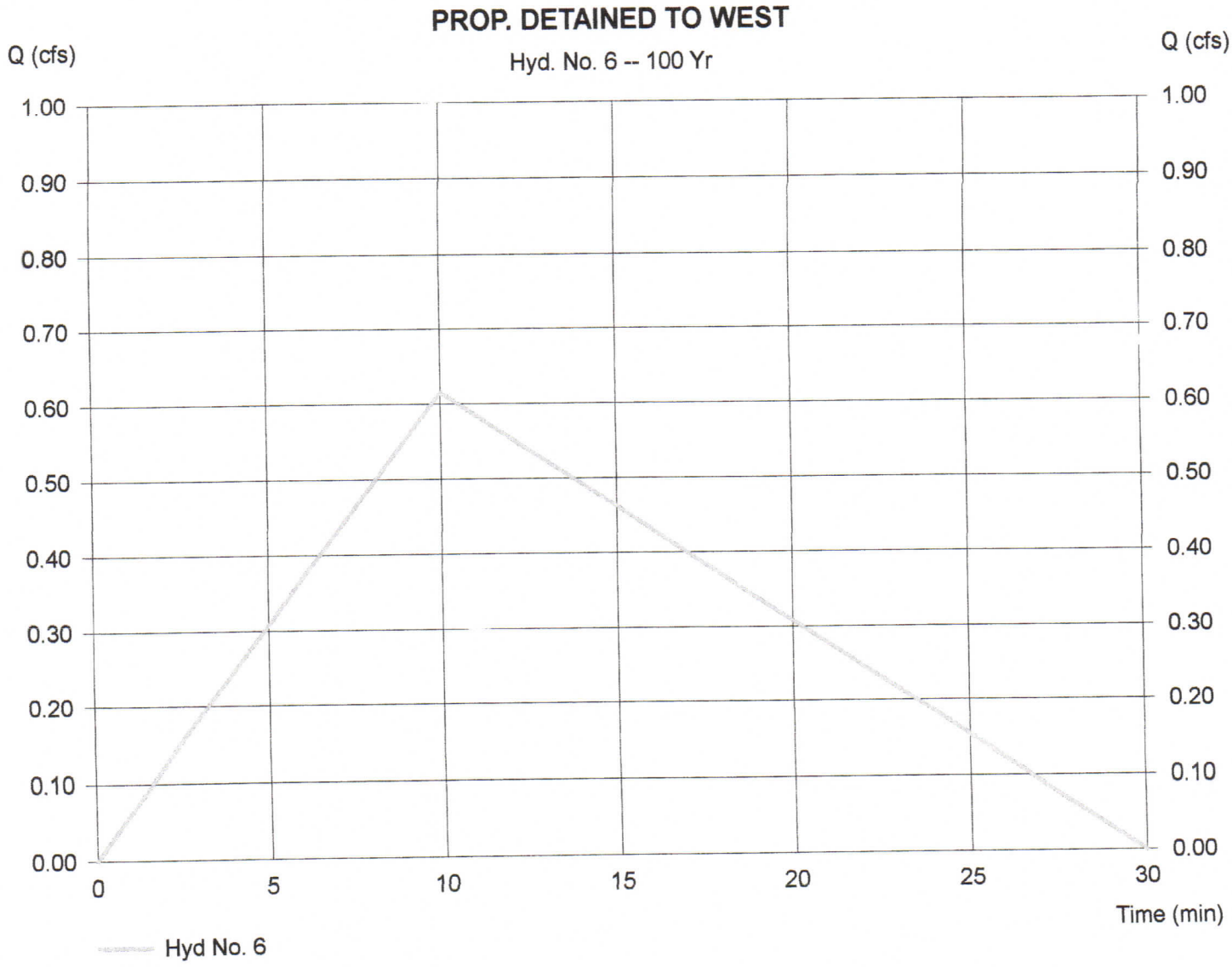


TABLE 3.1-2(B-1)
RUNOFF COEFFICIENTS
(AMC II)

LAND USE DESCRIPTION		Hydro. Soil Group A	B	C	D
Cultivated land	:without conservation treatment	.49	.67	.81	.88
	:with conservation treatment	.27	.43	.61	.67
Pasture or range land:	poor condition	.38	.63	.78	.84
	good condition	---	.25	.51	.65
Meadow: good condition		---	---	.44	.61
Wood or Forest land:	thin stand, poor cover, no mulch	---	.34	.59	.70
	good cover	---	---	.45	.59
Open Spaces, lawns, parks, golf courses, cemeteries					
good conditions:	grass cover on 75% or more of the area	---	.25	.51	.65
fair condition:	grass cover on 50% to 75% of the area	---	.45	.63	.74
Commercial and business areas (85% impervious)		.84	.90	.93	.96
Industrial districts (72% impervious)		.67	.81	.88	.92
Residential:					
Average lot size	Average % Impervious				
1/8 acre or less	65	.59	.76	.86	.90
1/4 acre	38	.25	.55	.70	.80
1/3 acre	30	---	.49	.67	.78
1/2 acre	25	---	.45	.65	.76
1 acre	20	---	.41	.63	.74
Paved parking lots, roofs, driveways etc.		.99	.99	.99	.99
Streets and roads:					
paved with curbs and storm sewers		.99	.99	.99	.99
gravel		.57	.76	.84	.88
dirt		.49	.69	.80	.84

NOTE: Values are based on S.C.S. definitions and are average values derived by an Advisory Committee for this Manual.

FIG. 3.1-2(B-1)-RAINFALL INTENSITY CURVES